2022

Mineral Resource Estimate, Viscaria Tailings facility

COPPERSTONE RESOURCES AB

MIKKO NUMMINEN

Summary

Introduction and property description

The Viscaria underground mine was established by LKAB in 1982, after discovering the deposit in 1972. LKAB operated the Viscaria mine from 1982 to 1986 and the operation was continued by Outokumpu Oy during the years 1986 to 1997, when Outokumpu decided on the closure due to falling metal prices, depletion of reserves and falling head grade.

Mineralization

Viscaria Mine produced approximately 14 Mton ore. This ore was concentrated in the Viscaria concentrator, and the tailings were deposited into the Viscaria Tailings facility. Approximately 1.2 Mton of concentrate was produced and sold from Viscaria. The remaining production was stored in the tailings facility.

The Viscaria mineralization is polymetallic in nature. The primary metal is Cu in chalcopyrite. Accessory elements modeled include Au, Ag, Zn, Co and Fe.

Drilling sampling and analyses

The Viscaria tailings facility was investigated by drilling, using rotary auger drilling. In total 69 drillholes were drilled and 759 samples collected and analyzed by ALS Global. The drilling was conducted in a regular grid, where the ground was accessible.

Mineral Resources

The mineral resources of the Viscaria tailings are estimated to be 12.7 Mt with 0.27% Cu, 0.87 ppm Ag, 0.06 ppm Au, 145 ppm Co and 0.24% Zn all above 0.06% Cu cutoff.

Table 1. Mineral resource of Viscaria tailings

Classification	Tonnes	Cu (ppm)	Ag (ppm)	Au (ppm)	Co (ppm)	Zn (ppm)
Measured	12544335	2 707	0.88	0.06	145	2 418
Indicated	164048	1 698	0.45	0.05	146	1 889
Measured+indicated	12708383	2 694	0.87	0.06	145	2 412

Metallurgical test work

Amenability flotation tests have been conducted by Oulu Mining School (OMS) in Finland. Samples average content of Cu of 0.58%. Results from the amenability test indicates Cu recoveries by flotation of 62.8%

Perc standard compliance and competency

Mineral resource estimation for Viscaria tailings facility was completed between December 2021 and January 2022. The mineral resource estimation was completed by Copperstone resource staff in their respective areas of expertise. The estimation was supervised by as a QP, Thomas Lindholm, who is independent from Copperstone Resources AB. The responsibilities of each areas impacting evaluation of the reasonable prospects of eventual economic extraction (RPEEE) are summarized in table 2.

Table 2. Roles and responsibilities of RPEEE evaluation

Area of responsibility	Responsible person	Competent person
Enviromental work	Anders Lundqvist	Thomas Lindholm
Exploration and geology	Marcello Imana	Thomas Lindholm
Resource estimation	Mikko Numminen	Thomas Lindholm
Mining	Glenn Nilson	Thomas Lindholm
Mineral processing	Glenn Nilson	Thomas Lindholm
Compiling report	Mikko Numminen	Thomas Lindholm

Mikko Numminen is responsible for geological modelling and resource modelling for this project. Mikko Numminen is not independent of the company, and he is a full-time employee of the Copperstone Resources AB. He works as a Senior Resource Geologist. Mikko Numminen is a member of EFG (European Federation of Geologists) which is a Recognized Professional Organization described in PERC. Mikko Numminen has over 10 years of experience in mining geology, Resource estimation and reporting.

Thomas Lindholm is responsible for reporting the mineral resources and reserves as a Competent Person. Thomas Lindholm is independent of Copperstone Resources AB.

Property description and location

Viscaria Copper project is located approximately 1200 km north of Stockholm in the municipality of Kiruna, Norrbotten province of Sweden.

The property is accessible by air, rail and road system. The municipality of Kiruna has an active airport which is connected to Stockholm by several daily flights. Rail track connects Kiruna to Swedish and Norwegian rail system. Major road E10 passes Kiruna and connects Kiruna to Luleå (345km) and Narvik (130km).

The project area is approximately 5km northwest of the Town of Kiruna. The Viscaria tailings facility is adjacent to LKAB Kiruna iron mine, separated from the LKAB held areas just by the border fence.

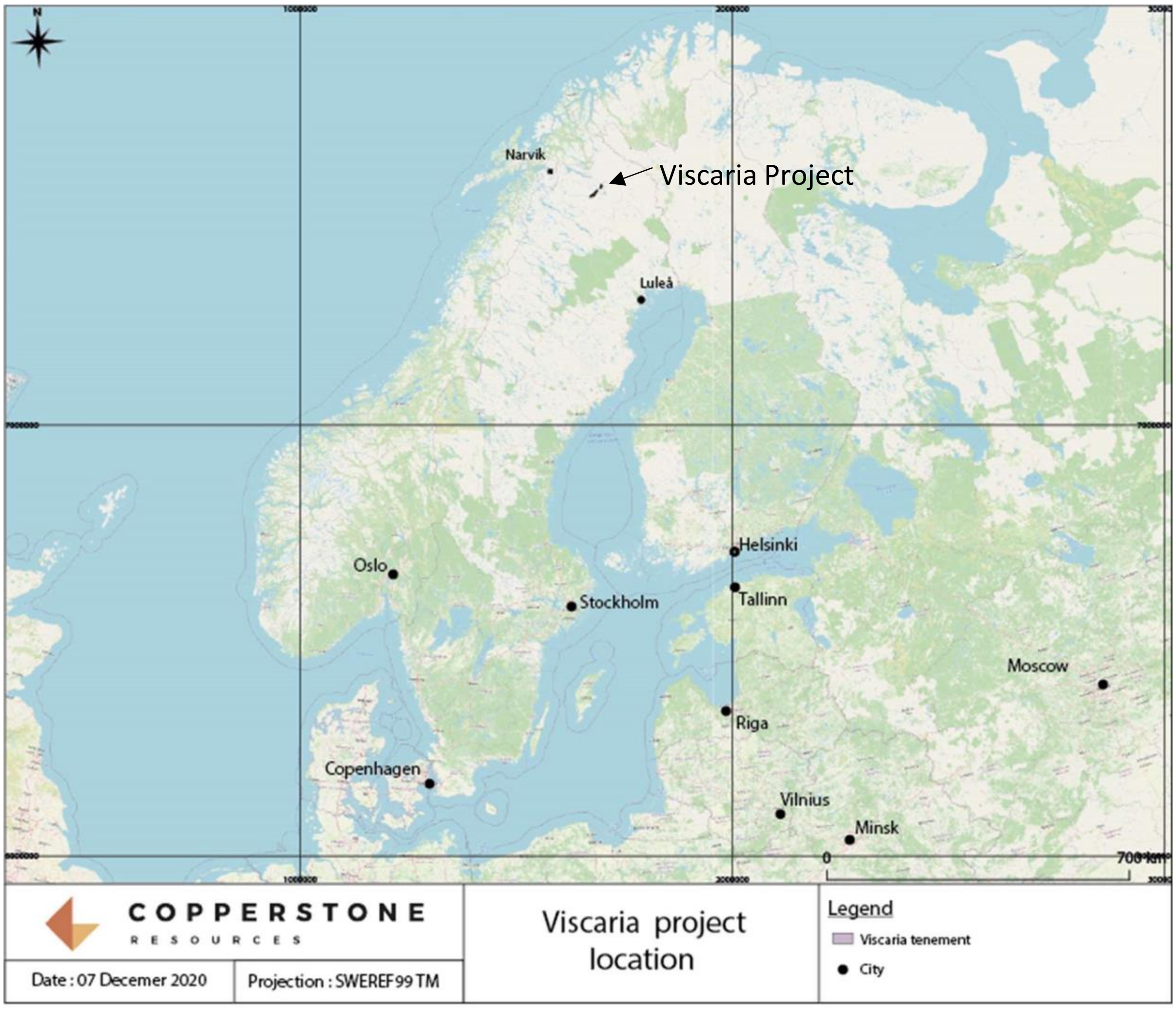


Figure 1. The location of the Viscaria project

Land tenure situation

Copperstone Viscaria AB is the proprietary owner of the exploration permit *Viscaria East* in Kiruna municipality, covering the old tailings dam through its 211.9 hectares.
Copperstone Viscaria AB is, in addition hereto, in the process of applying for an exploitation concession according to the Swedish Mineral´s Act.

The landowners are Statens Fastighetsverk "SFV" (100% owned by the Swedish state) and LKAB (Ön 1:1), and other stakeholders in the vicinity are, among others, Kiruna municipality, Laevas and Gabna reindeer herders, Friluftsfrämjandet/Ädnamvaara recreational area, Kurravaara 4:3, six windmill turbines, LKAB, Trafikverket and Försvarsmakten.

As per 10 November 2021, Copperstone Viscaria AB owned three exploitation concessions and 9 exploration permits, according to table 3.

Table 3. Copperstone Viscaria AB exploitation concessions and exploration permits

AWARDED EXPLOITATION CONCESSIONS						
NAME	AREA(ha)	VALID FROM	VALID TO	MINERAL	MUNICIPALITY	OWNER (100 %)
Viscaria K nr 3	115,7	2012-01-16	2037-01-16	gold, iron, copper, silver, zinc	Kiruna	Copperstone Viscaria AB
Viscaria K nr 4	30,03	2012-01-16	2037-01-16	gold, iron, copper, silver, zinc	Kiruna	Copperstone Viscaria AB
Viscaria K nr 7	63,81	2018-03-26	2043-03-26	copper	Kiruna	Copperstone Viscaria AB
	291,15	TOTAL NUMBER OF HECTARS OF EXPLOITATION CONCESSIONS				
AWARDED EXPLORATION PERMITS						
NAME	AREA(ha)	VALID FROM	VALID TO	MINERAL	MUNICIPALITY	OWNER (100 %)
Viscaria East*	211,94	2017-06-09	*	copper	Kiruna	Copperstone Viscaria AB
Nihka East	144,14	2015-06-16	2022-06-16	copper	Kiruna	Copperstone Viscaria AB
Viscaria nr 101	1 472,29	2002-10-16	2022-07-07	copper	Kiruna	Copperstone Viscaria AB
Viscaria nr 107	1 842,75	2009-08-10	2022-08-10	copper	Kiruna	Copperstone Viscaria AB
Rengarde nr 1	3 517,31	2018-11-08	2022-11-08	copper, lead, zinc, iron, gold, silver	Kiruna	Copperstone Viscaria AB
Kirkkovaarti nr 1	386,37	2018-11-08	2022-11-08	copper, lead, zinc, iron, gold, silver	Kiruna	Copperstone Viscaria AB
Viscaria nr 112	1 944,82	2011-12-05	2022-12-05	copper	Kiruna	Copperstone Viscaria AB
Goddevarri nr 101	148,44	2019-12-04	2023-12-04	copper, lead, zinc, iron, gold, silver	Kiruna	Copperstone Viscaria AB
Viscaria nr 1	818,71	2008-06-24	2024-06-24	copper	Kiruna	Copperstone Viscaria AB
	10486,77	TOTAL NUMBER OF HECTARS OF EXPLORATION PERMITS				
*The exploration permit is valid during the court process regarding the extension application of the permit.						

Copperstone Viscaria AB´s three granted exploitation concessions under the Minerals Act (SFS1991: 45) are as follows; Viscaria K no 3 and K no 4 which were granted by *Bergsstaten* (Eng: Mining Inspector) in January 2012 and Viscaria K no 7 which was granted in March 2018. The extent of Copperstone Viscaria AB permit portfolio is shown in Figure 2.

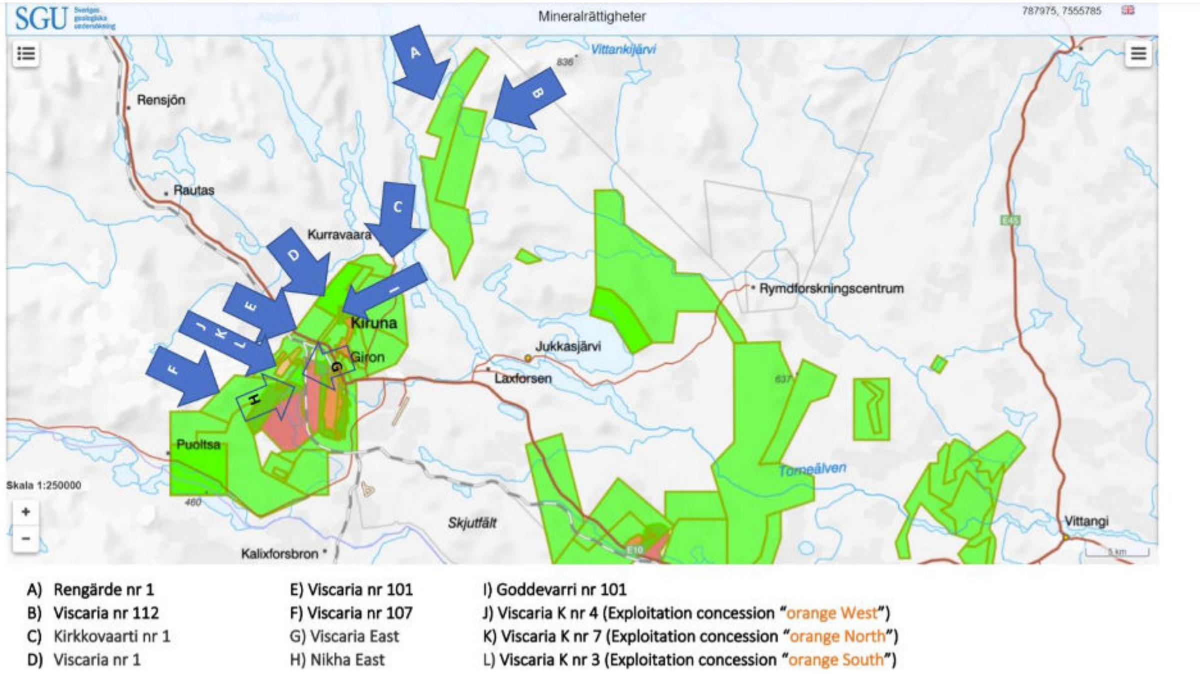


Figure 2. Map of Copperstone Viscaria AB permit portfolio

Copperstone Viscaria AB is the proprietary owner of the exploration permit *Viscaria East* in Kiruna municipality, covering the main parts of the old Viscaria tailings dam (pls see picture 3 below) through its 211.94 hectars.

Copperstone Viscaria AB is the proprietary owner of the exploration permit *Viscaria 101* in Kiruna municipality, covering the remaining part of the old Viscaria tailings dam (figure 3.) through its 1 472,29 hectars.

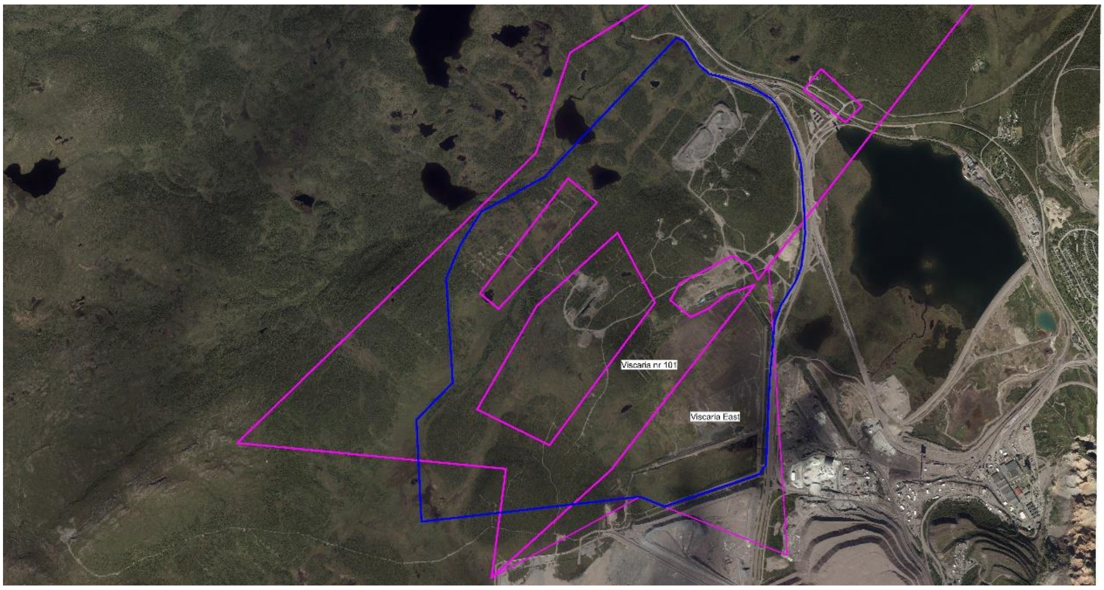


Figure 3 dam and Copperstone Viscaria permit portfolio

In addition to the above, Copperstone Viscaria AB, subsequent to the award of the Viscaria no 7 exploitation concession, is entitled to a buffer zone of [1km radius] from the border of the awarded exploitation concession, covering some 30% of the old tailings dam.

Copperstone Viscaria AB is, finally, in the process of applying for an exploitation concession regarding the old tailings dam, in accordance with the Swedish Mineral´s Act.

Copperstone Viscaria AB has continuous discussion with other landowners as well as stakeholders.

Copperstone Viscaria AB has been awarded a 25-year land lease from the County Administration Board of Norrbotten (not including Viscaria no 7), which has been appealed to the Swedish Government. The land lease is still valid and will be so up and until the Government´s final decision. Copperstone Viscaria AB in addition hereto, has applied for a new land lease, this time including Viscaria no 7 exploitation concession.

Environmental situation

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 application for an environmental permit application will, in addition to Remining, include present granted concessions at Viscaria no 3 no 4 and no 7.

In addition, national interest for reindeer herding is protected under the Environmental Code, Chapter 3, Section 5.

Description of the deposit

Viscaria tailings facility is located in the south side of the mining area, right next to LKAB Kiruna Iron ore mine. The Viscaria mine was in production from 1982 to 1997. Approximately 14 million tonnes were produced from the Viscaria mine and processed in the Viscaria concentration plan. In addition to Viscaria, the nearby Pahtohavare mine ore was processed in the Viscaria concentration plant. The Ore was trucked to the plant at the end of the Viscaria concentrator production during 1989 to 1996. In total 1.7 million tonnes of Cu/Au ore was milled in the Viscaria concentration plant.

Viscaria Mine produced approximately 14 Mton ore. This ore was concentrated in Viscaria concentrator. In total of approximately 1.2 Mton of concentrate was produced and sold from Viscaria. The remaining production was stored in the tailings facility. This report focuses on this tailings material.

It is the company's view that the predecessors deposited the tailings as sludge to the northern parts of the tailings facility, the clearing pond is located in the southern part of the facility and the topography is sloping towards south. It is assumed that fine grained tailings were deposited further, and larger grain size and denser mineralized particles were deposited near the discharge points. Discharge points were changing in time in order to fill the pond evenly.

The internal structure of the tailings facility is estimated to correspond to sedimentary feature rather than a normal mineralization feature. As a sedimentary structure it resembles more a river sandur like deposition rather than river delta structure. This is due to low water levels in the pond. In order to produce a delta structure, the deposition should be in deep water. This deposition style creates horizontally continuous layers, and the vertical or angled deposition is minimal.

Exploration work

Sampling

One of the sampling programs for the Viscaria tailings facility started 24.8.2021 and lasted for three weeks ending at 14.9.2021. The Sampling grid was planned to cover the area of the tailings facility with even sample distribution (figure 4). Two drillholes existed in the area from Copperstone 2020 campaign. One of these holes was used as a twin hole and the other substitutes a hole from the grid. Originally the sample grid was designed to cover the full extent of the area, but due to bad ground conditions a few sample sites were left out in the southern part of the area.

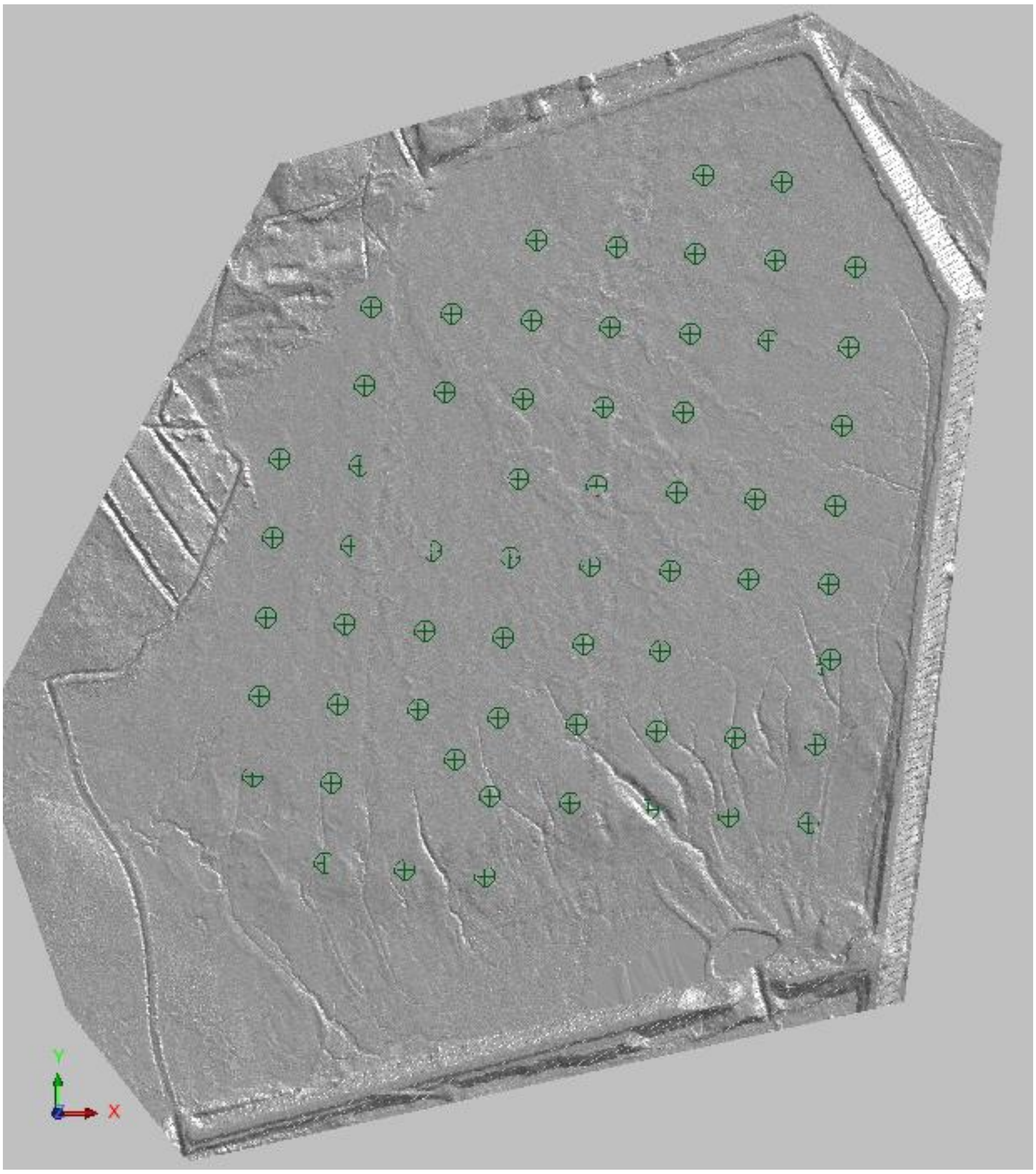


Figure 4. The drillhole grid used to explore the tailings

A rotary auger equipment was used in sampling. The auger diameter was 82mm and the drill rig used was a geomachine75. The sampling was conducted in vertical drillholes meter by meter, until a contact to the bottom peat layer or the till was reached. This material was not sampled.

Figure 5. Drill machine at the hole D5 sample from 1-2 meters

The samples were gathered from the auger bit in 1m sample intervals. Half of the sample material was collected and stored in a plastic bag, closed with a zip tie and labelled within the sample bag in a separate compartment to avoid sample mixing and label damage (figure 5.) Every 20th sample was fully sampled when a duplicate sample was collected. Collected samples we gathered in natural moisture state, which was preserved by closing the bags tightly. These samples were transported in two batches to ALS Global in Piteå with no delay.

Figure 6. The samples were stored in plastic bags, closed with zip tie. The sample information was included with each sample.

Bulk density

The bulk density was measured from the auger drill samples. Since the material sampled was not in situ position but lifted from its original location disturbing the moisture conditions of the sample, the density measurements were conducted in two separate methods. In order to measure the material dry density a pycnometer method was used. Since the material is already crushed and saturated with water, using just the pycnometer readings as the density would overestimate tonnage. Therefore, the samples were measured with another method. A standard volume Archimedes' method was used to determine the density of the volume of the samples. These two methods were used to model density and pore volume of the tailings. Since the nature of compaction of material in tailings, a certain compaction factor was used. This is better explained later in this report.

Sample preparation and assaying

Samples were shipped to ALS laboratories in Piteå for sample preparation and pulps were sent to ALS lab in Ireland where chemical analyses were conducted.

The preparation round followed the procedure PREP31Y with pulverizing split to better than 85% passing 75micron and OA-GRA05s (moisture determination by loss on ignition).

Density determinations included methods OA-GRA08c (pycnometer method) and OA-GRA09 water displacement method)

Assaying included multielement determinations following aqua regia dissolution via method ME-ICP41 (aqua regia with ICP-AES finish)

Gold determinations were obtained via fire assay and AAS (Au-AA23 method)

Non carbonate carbon determinations were obtained using method C-IR06a

The selected assay methods were considered appropriate for the purpose of estimating mineral resources.

Quality assurance

The QA/QC procedure consisted of standards and duplicate samples. The standard material used were Oreas 520, 521 and 523. The control sample submission rate was 1/10 samples. The sample count for Oreas 520 was 20 samples, Oreas 521 17 samples and high grade Oreas 523 had only two samples submitted. A total of 32 duplicate samples were analyzed.

The full results on the main estimated elements are summarized in appendix 2. In this chapter only Cu and Au results are presented with more emphasis and graphs.

Duplicate assays

Duplicate assays for Cu show only a couple of outliers, one above 10% tolerance limit and one below 10% tolerance limit. Most of the data aligns along the expected value of the original assay. Based on these figures the repeatability of the Cu assays can be considered good. (figure 7)

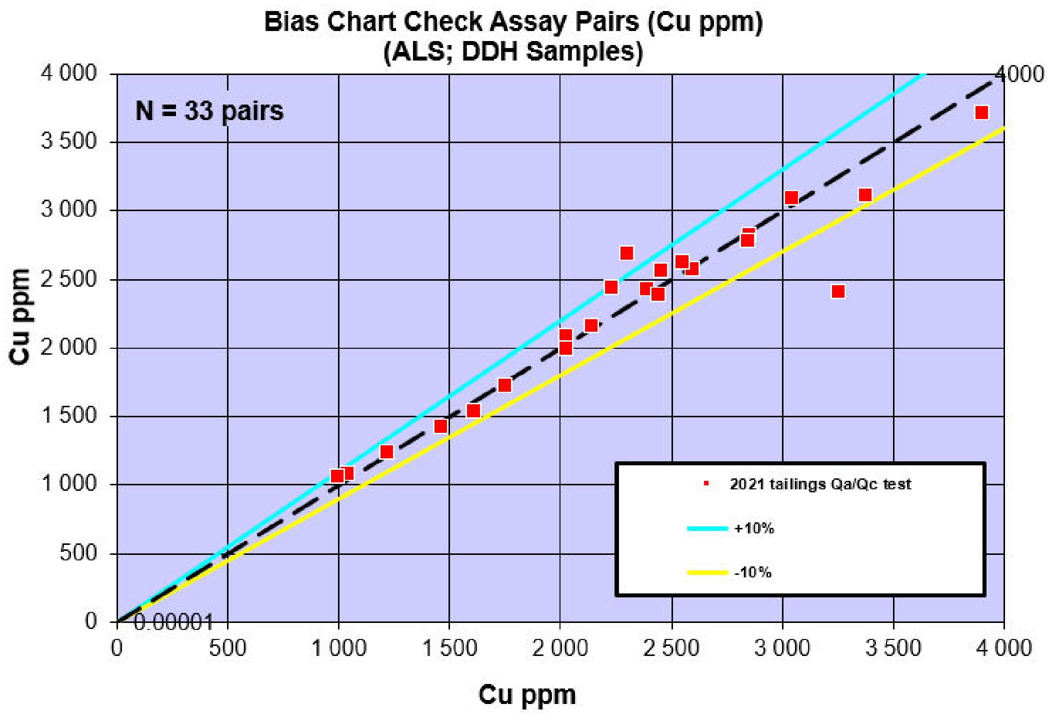


Figure 7. The duplicate check for Cu assays

Au assays suffer from low-grade assays, which inflict more scattered behavior on the graphs. Yet most of the data is still within +-10% range from the original assays. The result can be seen in figure 8.

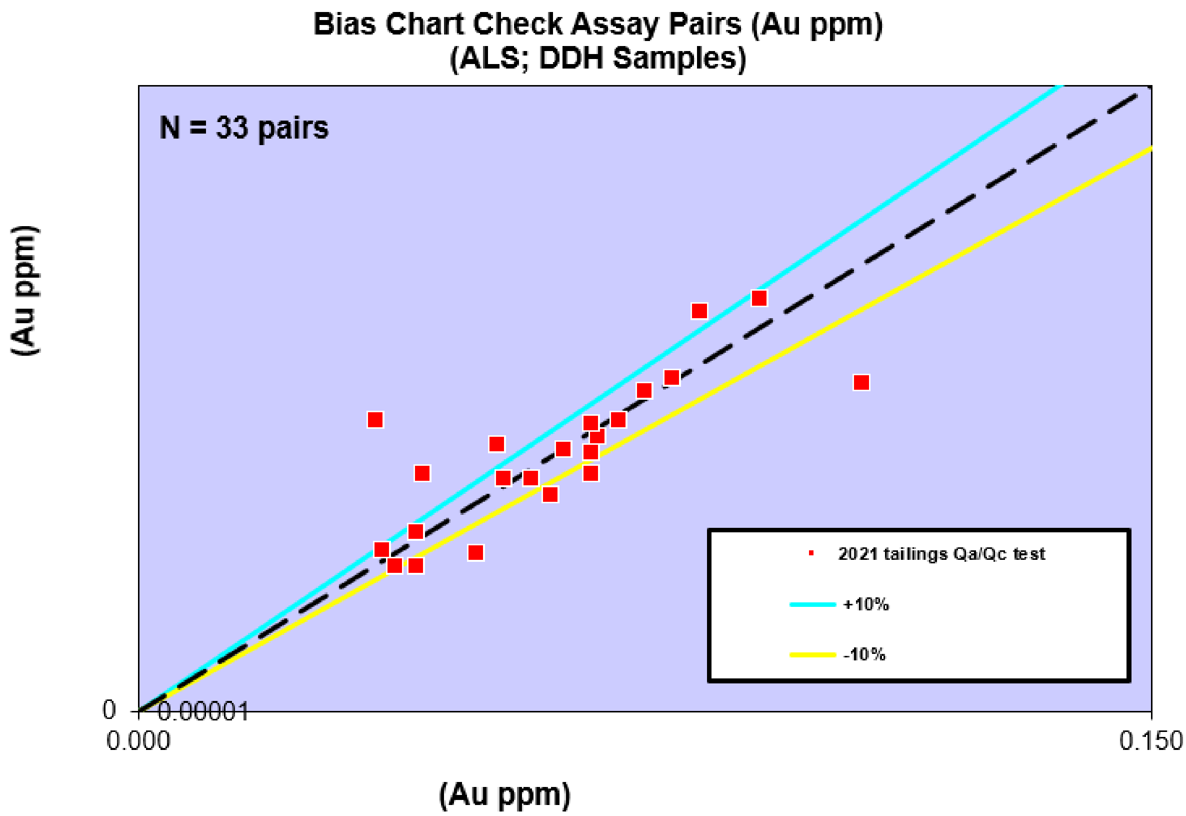


Figure 8. The duplicate check for Au assays

The duplicate graphs for other analyzed elements are presented in appendix 2. In these graphs a similar trend is present. Zn and S show good repeatability as did Cu. Ag show a similar graph to Au.

Standards

As mentioned before, three different standards were used. The Oreas 523 had only two assays, therefore no graphs were drawn for the results.

Cu standards in both OREAS 520 and 521 show similar tendency. All assayed samples are within +-2 standard deviations, but in both standards all the assays are above standard value. The reason for this high bias is not known at the time of writing this report.

ALS has investigated including extensive checks, calibration, and linearity tests in the ICP instrument, there are no indication of any bias. ALS is not currently using any OREAS standard from this series and Cu tenors for their internal control.

ALS took part in the validation of OREAS 521 reference material. In this validation ALS reported slightly elevated Cu values by aqua regia in comparison to other labs. ALS believe that this could be down to their method as they achieved better Cu recovery during digestion. Labs may have very slightly different procedures and the recovery could be their signature.

Since the values are within +-2 standard deviation, the results are deemed acceptable. Figure 9 and figure 10.

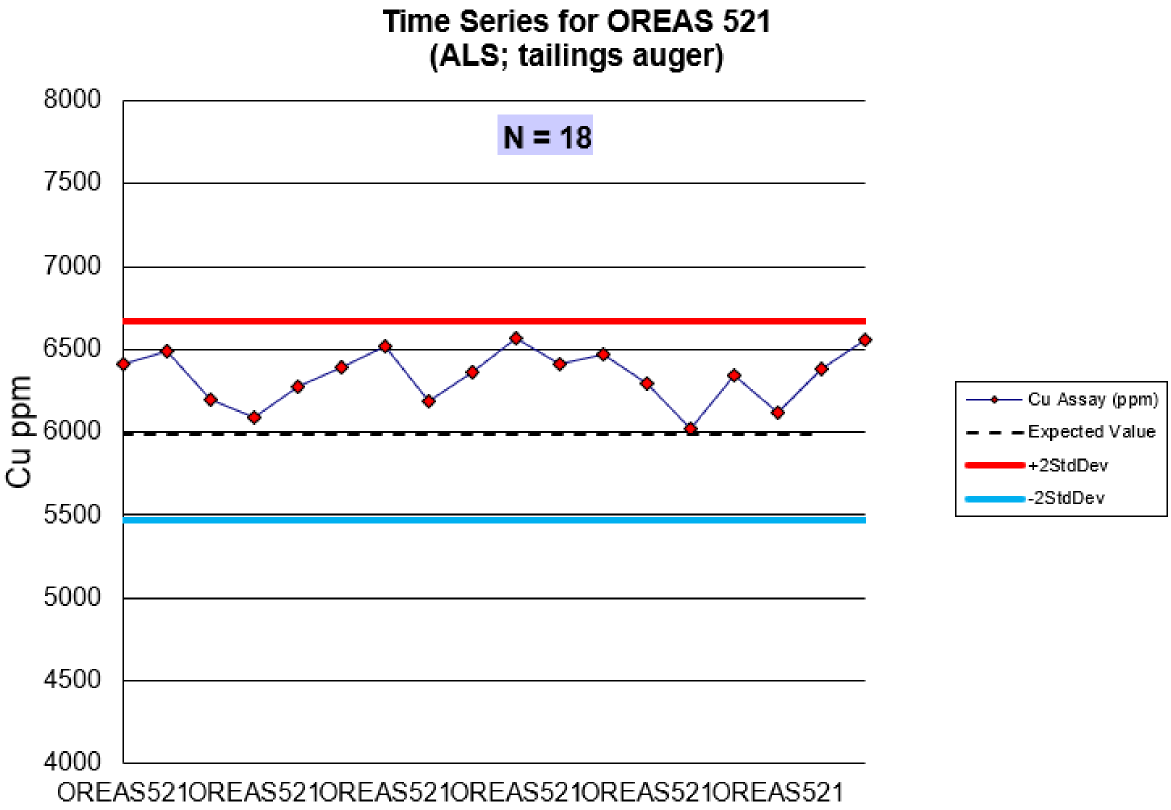


Figure 9. The Oreas 521 standards for Cu

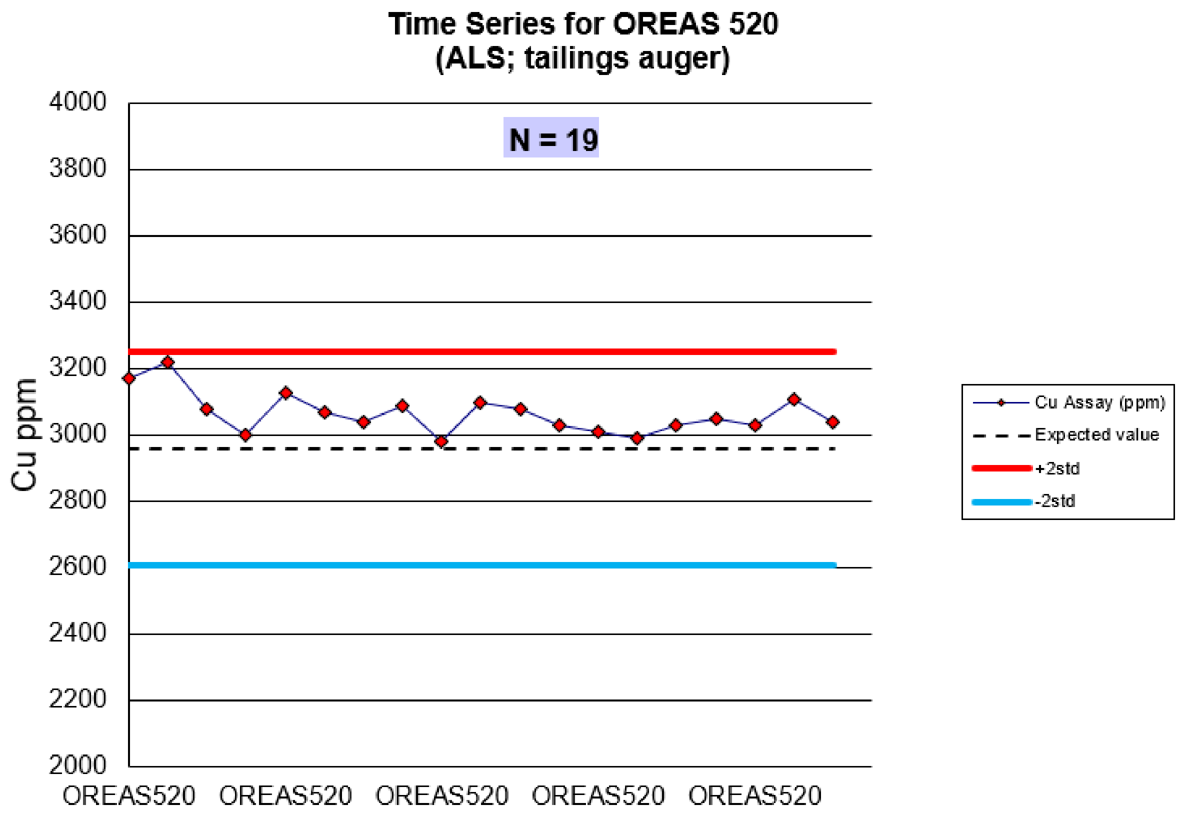


Figure 10. The Oreas 520 standards for Cu

Similar behavior is seen in Zn and Co standards, whereas S standards show low tendency. It is suspected that the reason is the same as in the Cu standards.

The Au standards does not suffer from similar issues. The assays plot on both sides of the expected value. For Oreas 520 standards, two samples are slightly below +-2 standard deviations, but this is likely due to low au content of the standard (figure 11 and figure 12). Standard plots were not created for Ag, since the Ag value in standards was too close to the detection limit and no reliable plots could not be created.

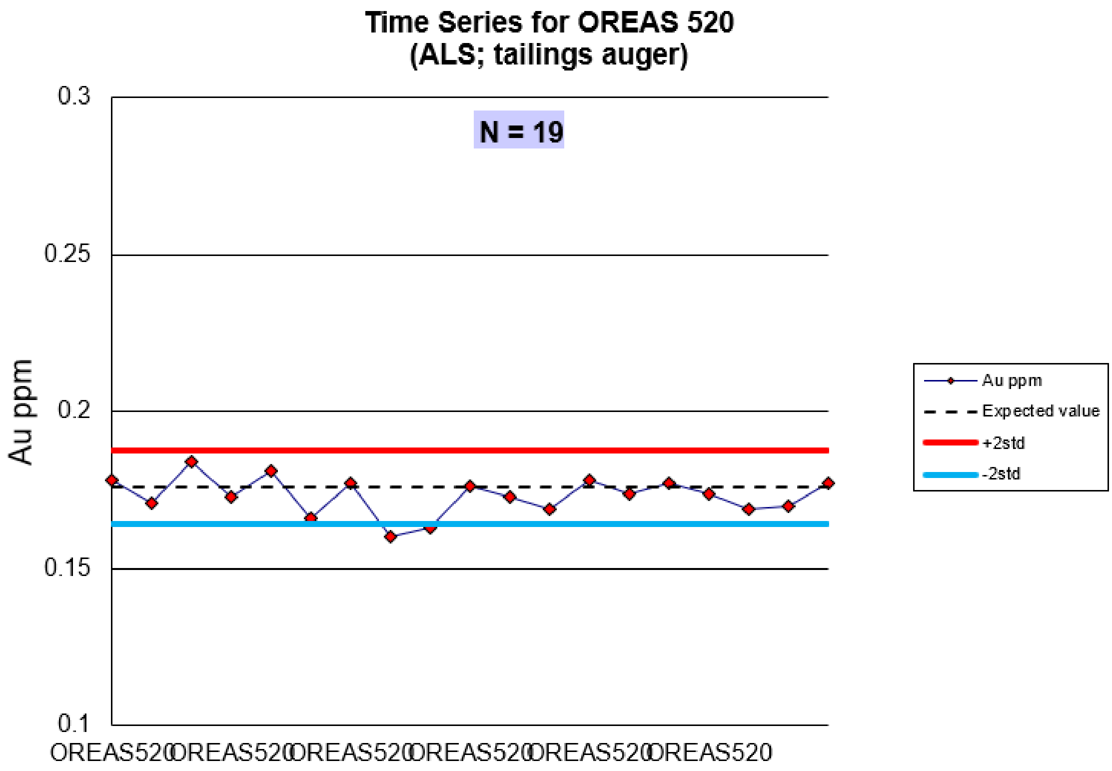


Figure 11. The Oreas 520 standards for Au

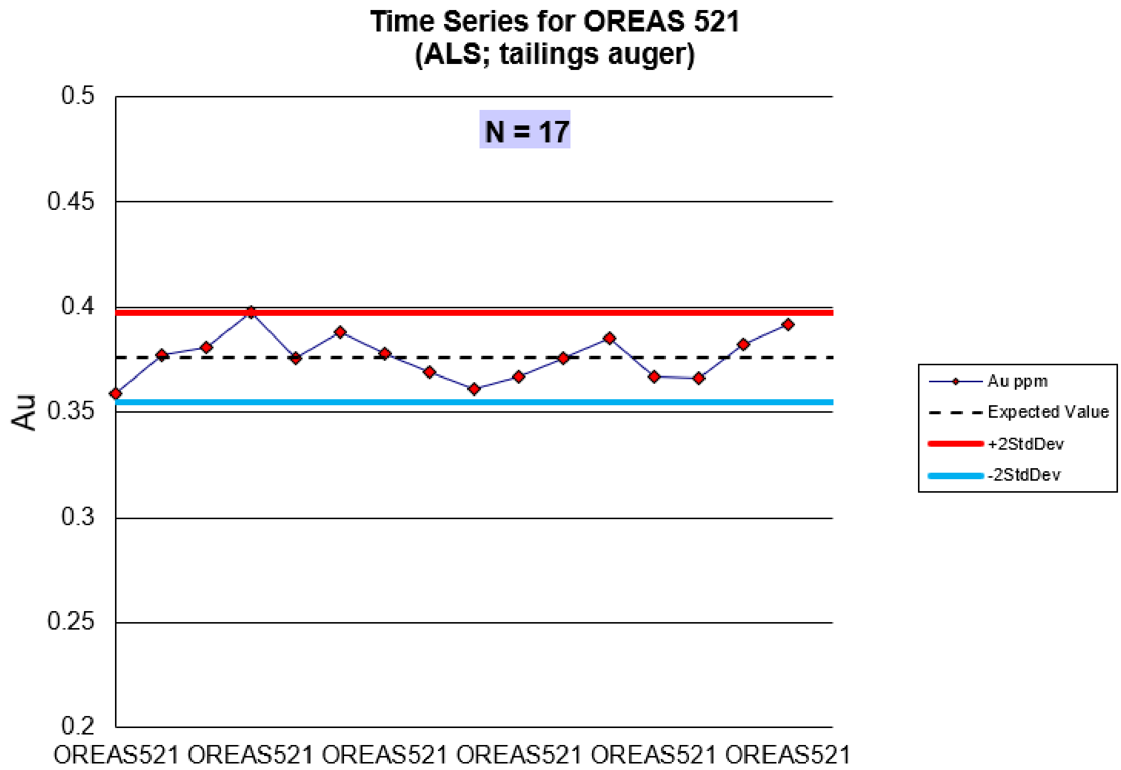


Figure 12. The Oreas 520 standards for Au

Estimated Mineral Resources

Modelling

3D modeling of mineralized material was based on the high-resolution terrain model of the Viscaria mine site area. The outlines of the tailings facility has been determined from this model. Also, the surface of the 3d model is based on this model. The location accuracy was checked against the drill hole collars, which were measured with differential gps (D-GPS). The extremities of the tailings facility has been interpreted from the high resolution terrain model, by leaving a 5-10 meters buffer zone to the dam walls in order to avoid over estimating the volume of the area (figure x).

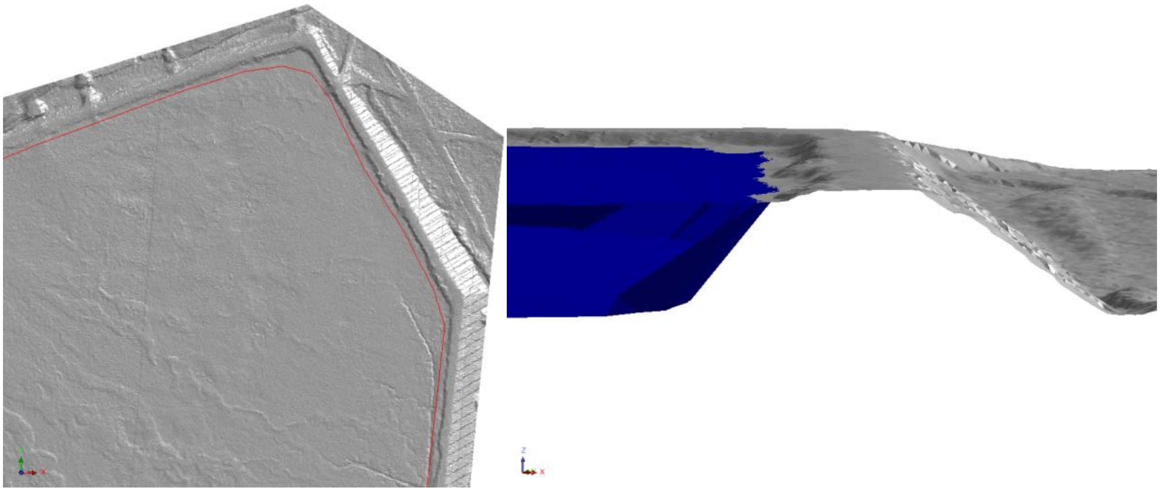


Figure 13. Left image show the red outline of the 3d model and the buffer to tailings dam wall. On the right image is a section view of the tailings dam wall and interpreted 3dm solid in blue.

The bottom of mineralized material model is based on the end of the drillholes. Drilling did not exceed through the bottom of the pond. Therefore, by using this information the volume will not be overestimated.

The pond walls are angled approximately 30 degrees on the outside. The same approximate angle was used to angle the sides of the 3D model (figure 13).

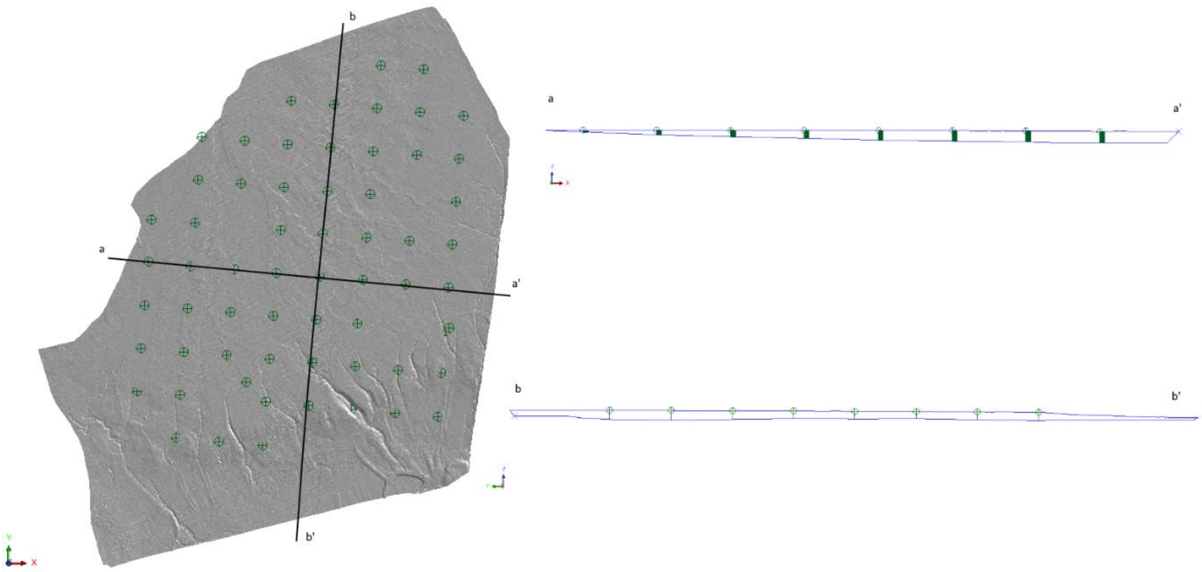


Figure 14. The 3D model used to estimate the volume and grade of the tailings facility

The total volume of the tailings facility is 8.7 million m^3.

Top cutting

The need for top cut was found studying basic statistic histograms, see section univariate statistics. Some of the histograms, showed long tails of high grades after normal distribution curve. This kind of high-grade samples can cause overestimation in the resource estimation process and need to be addressed with top cutting the grade to a specific value. The raw data was investigated using log probability plots for each element analyzed. In the log probability plot the grade continuity is evaluated and when the continuity starts to break up it indicates the proper top cut grade.

The top cut was needed for Copper (figure 15) Zinc (figure 16) and Gold (figure 17) the top cut value for Cu was set to be 6000ppm, for Zn 4500pm and for Au 0.19ppm

Other modelled elements did not require top cut.

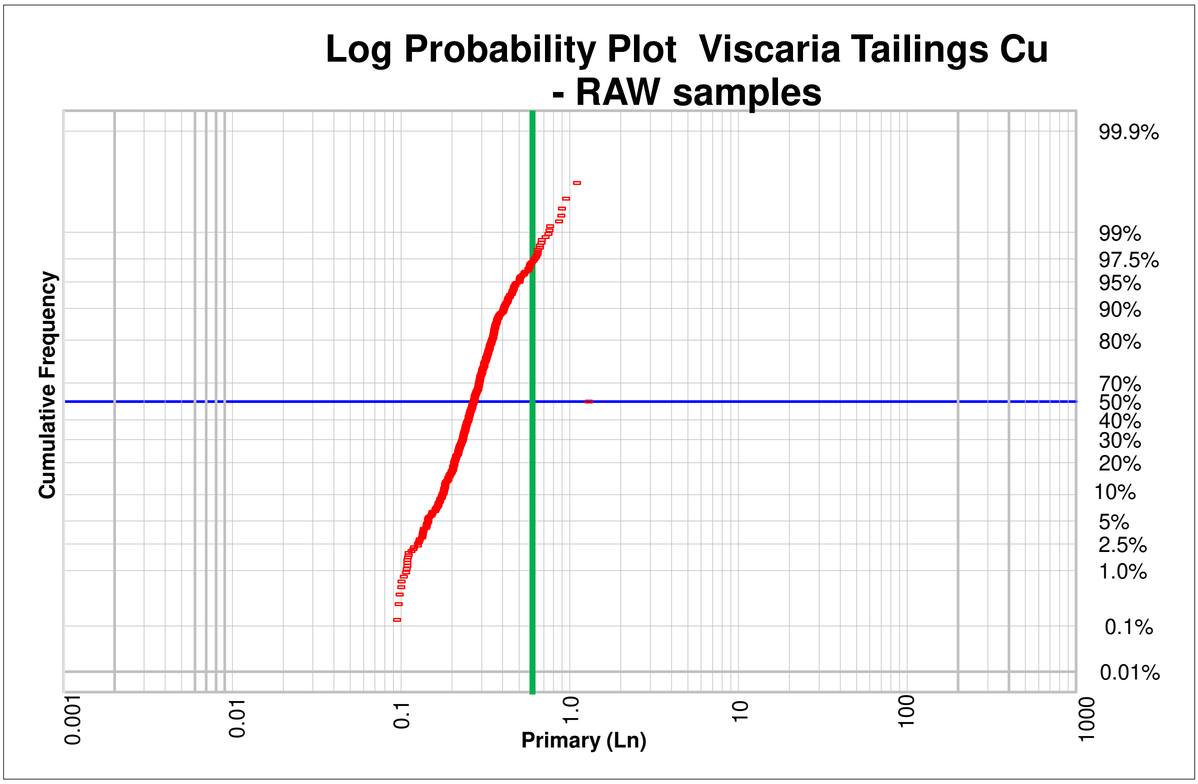


Figure 15. The log probability plot of the Cu samples. The top cut grade is set to 0.6% corresponding to 6000ppm level.

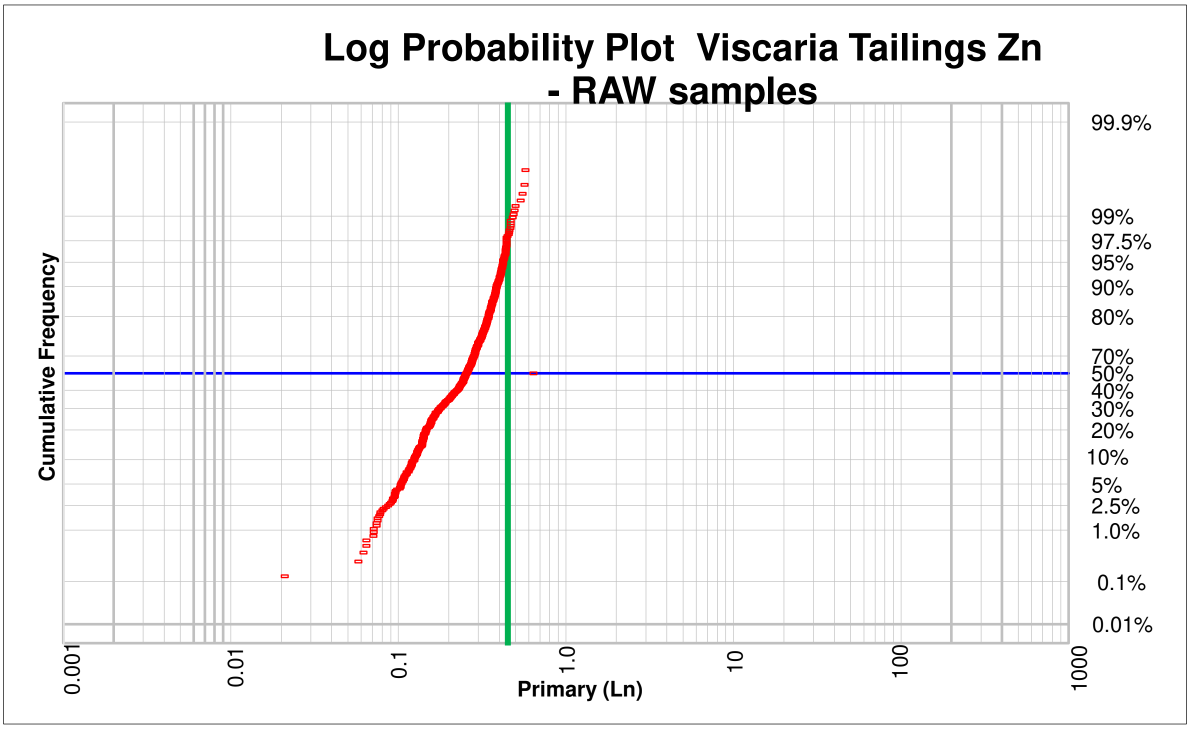


Figure 16. A log probability plot of the Zn samples. The top cut grade is set to 0.45% corresponding to 4500ppm level.

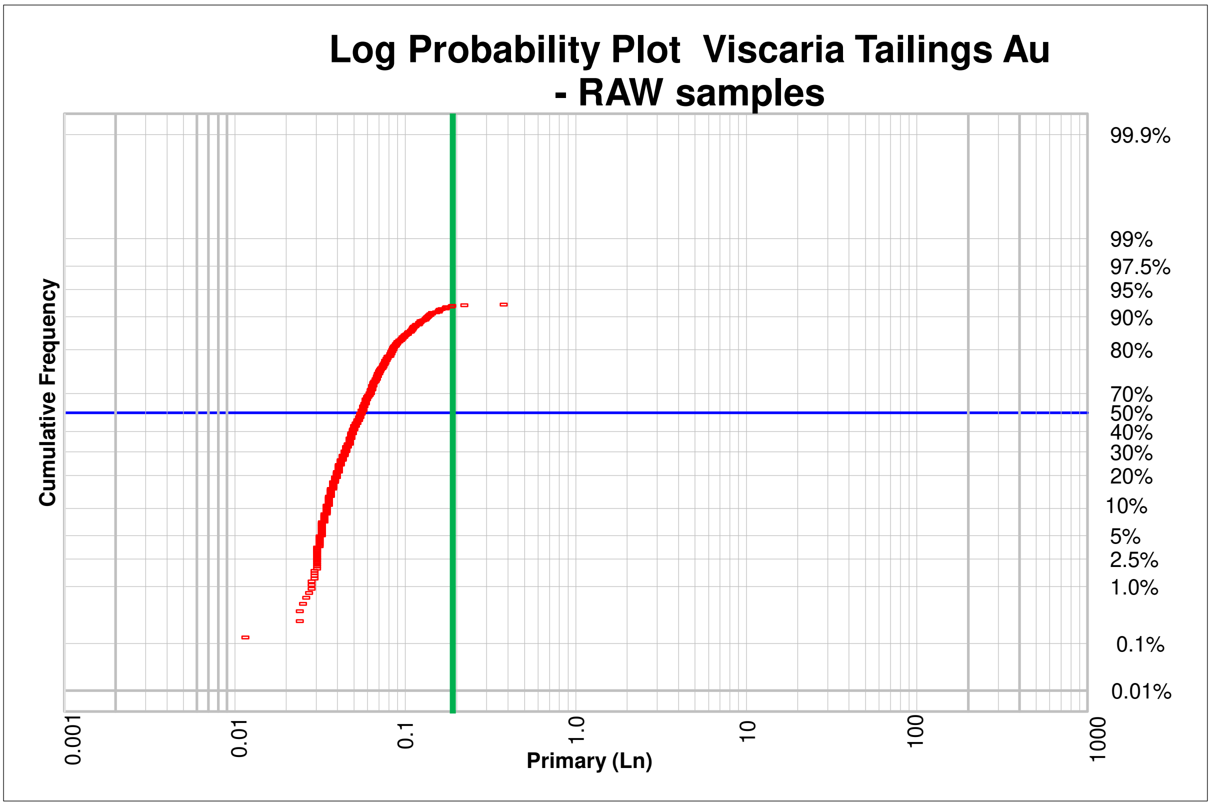


Figure 17. A log probability plot of the Au samples. The top cut grade is set to 0.19ppm

All the top cut grades were modelled along the uncut grade to later evaluate the effect of the top cut.

Univariate statistics

Univariate statistics was conducted for all estimated elements. Univariate statistics are done in order to study datasets, in order to confirm geological interpretation. As known, sample data within geological unit follows normal distribution. If this is not the case, there is a reason to believe that this dataset is not part just one geological domain.

Table 4. Basic statistic of studied elements

	au ppm	au_cut ppm	ag ppm	as ppm	co ppm	cu %	cu_cut %	fe %	s %	v ppm	Zn %
min	0.01	0.01	0.10	6.00	83.00	0.09	0.09	3.49	0.52	54.00	0.02
max	0.36	0.12	2.20	342.00	301.00	1.24	0.40	21.60	3.51	194.00	0.61
median	0.05	0.05	0.90	110.50	140.00	0.26	0.26	10.95	1.62	154.00	0.24
average	0.06	0.06	0.87	111.93	143.34	0.28	0.26	11.09	1.60	153.27	0.24
skew	3.13	1.14	0.16	1.00	1.59	2.69	0.14	0.41	0.11	-1.02	0.30
Kurtosis	20.62	0.76	-0.12	4.23	5.17	13.79	-0.55	0.39	0.18	4.17	-0.38
variance	0.00	0.00	0.17	1 472.36	665.40	0.01	0.01	6.29	0.19	215.94	0.01
std	0.03	0.02	0.41	38.37	25.80	0.11	0.07	2.51	0.43	14.69	0.10

As seen from figures 18-23, the Cu, Au, V, Co, As and S follow the normal distribution curve. Cu and Au have long tail of high values with few samples. This issue is addressed in the chapter top cutting.

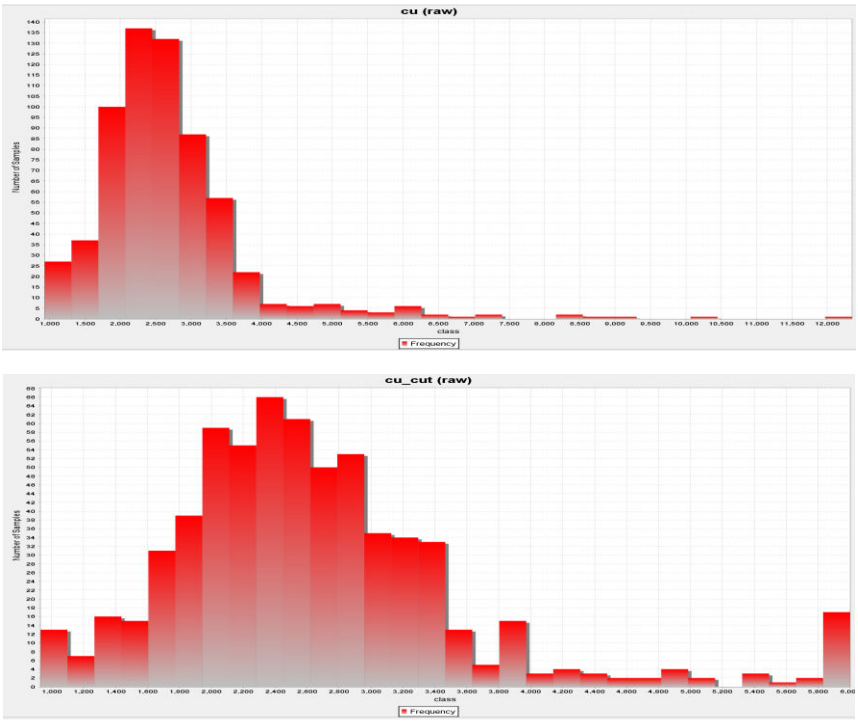


Figure 18. Cu sample distribution upper image show the raw distribution and the picture below show the top cut distribution.

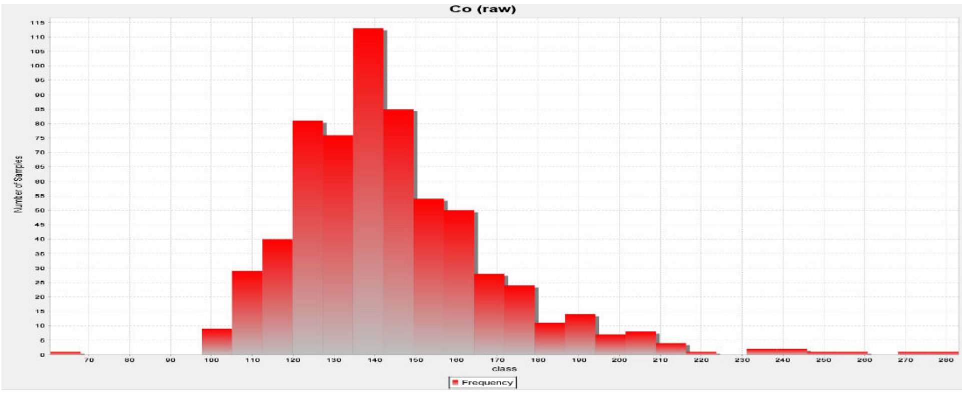


Figure 19. Cobalt sample distribution shows a good normal distribution curve without top cut

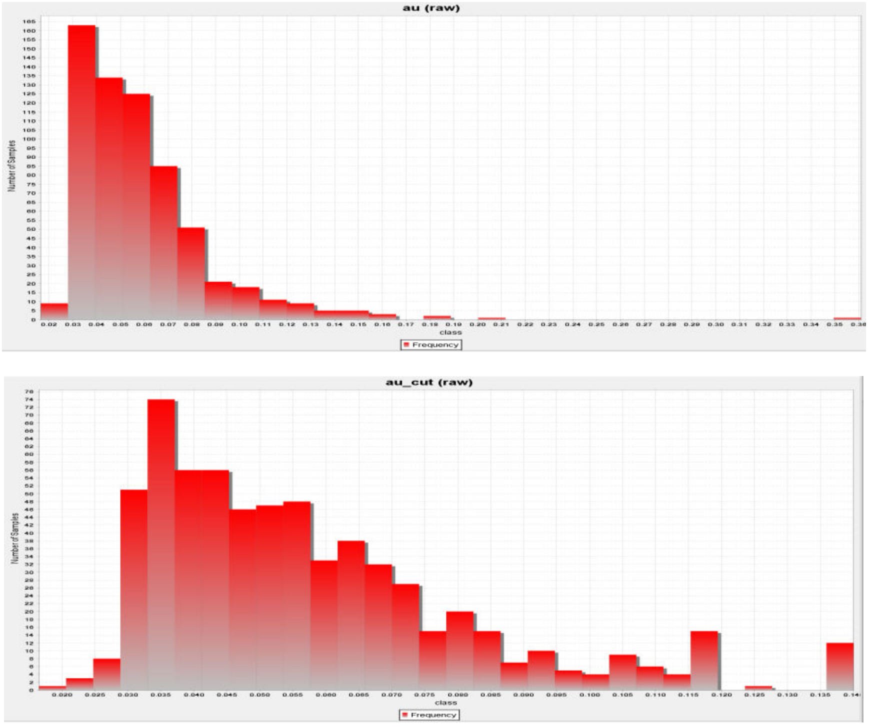


Figure 20. Au sample distribution upper image show the raw distribution and the picture below show the top cut distribution.

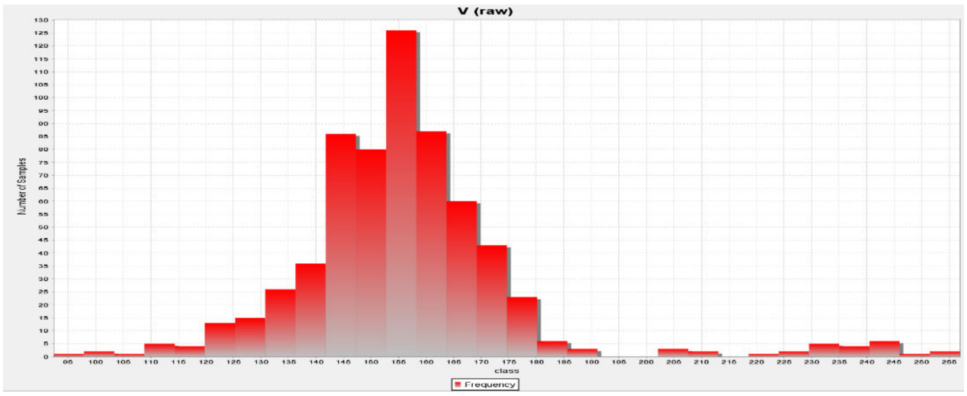


Figure 21. Vanadium sample distribution shows a good normal distribution curve without top cut, if the Vanadium is produced as a product, a top cut should be studied and considered

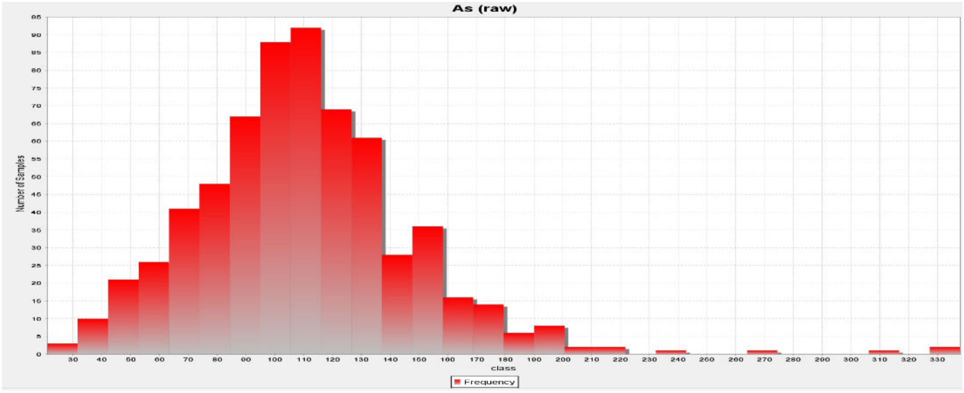


Figure 22. Arsenic sample distribution shows a good normal distribution curve without top cut

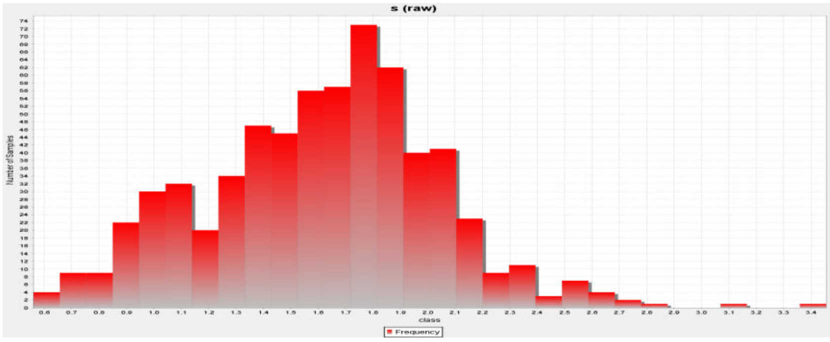


Figure 23. Sulphur sample distribution show a fairly good normal distribution curve without top cut

For zinc the histogram showed clear two peaks in the distribution. This is an indication that two separate sample populations are present in the data. To model the distribution correctly, these populations need to be geologically separated from each other. This process is described in the paragraph domaining. Also, Silver shows a mixed population distribution. It is not as clear as Zn and low silver grade can influence distribution. Silver grade was not domained since silver was not estimated as primary commodity.

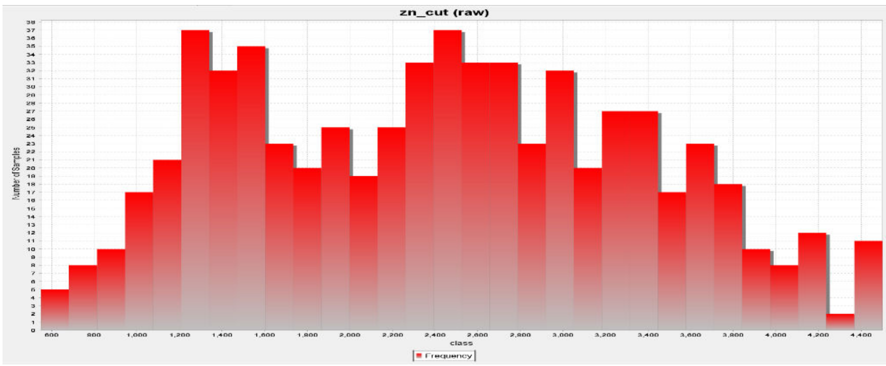


Figure 24. the Zinc sample distribution show mixed dataset of the two geological domains.

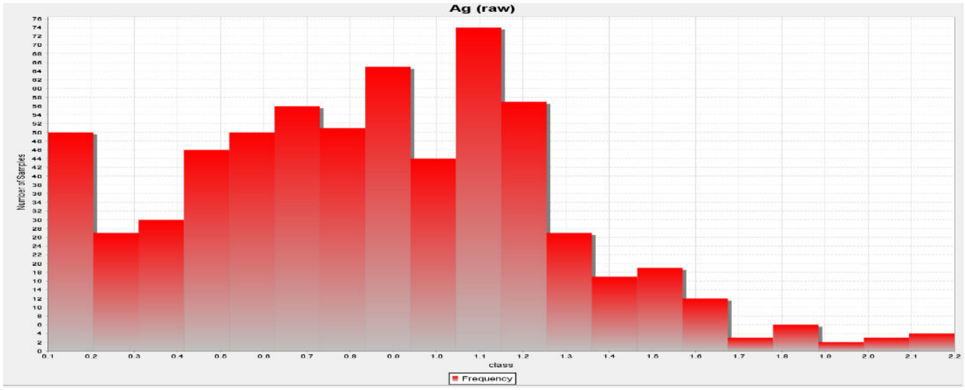


Figure 25. Silver sample distribution shows a possible mixed dataset of the two geological domains.

Composites

The composites were created from the database using the 3D solid, the intersections were composited using Surpac compositing tools fixed length parameters so that 75% was the minimum length to be composited. Composite length was 1m, since drilling samples were collected at 1m spacing. Composites were created for Cu, Zn, Au, Ag, S, Co, V, As, Cu_cut, Au_cut , Zn_cut and density.

Composites were created inside modelled tailings facility. Some of the composites were shorter than 1m. Due to the compositing method these composite points were included into the composite file if the length was over 75cm. In total 644 composite points were created.

Density composites were conducted from the density sampling described in section bulk density. The density was composited with the same parameters as the grades and uses single domain. Two parameters were composited, the specific gravity and the bulk density.

Due to the nature of the 1m sampling and the even sampling grid, no declustering was considered necessary and thus not performed.

Domaining

As described in the section univariate statistics, the Zn analyses show a clear two population distribution. It is unclear if there has been differences in grade or material fed to the tailings facility or if this is due to for example weathering, where the topmost parts of the tailings would have weathered. However, the Viscaria mill utilized ore from two different mines, Viscaria and Pahtohavare. It is reported that Pahtohavare did not contain zinc and the production of Pahtohavare occurred at the end of the production period of Viscaria mill.

The origin of the two sample populations in Zn is unclear, but the two populations were clear. The high-grade Zn population is located inside the whole tailings model. This area was modelled separately using the sample data (figure 26.)

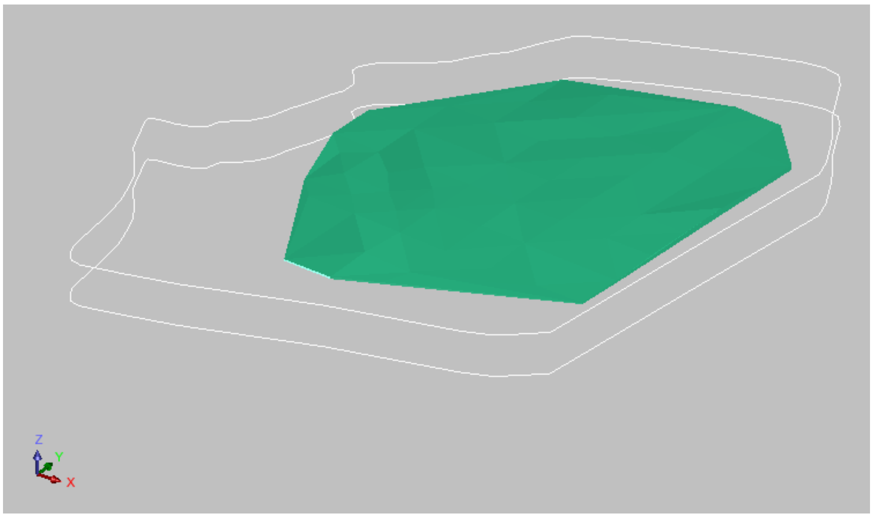


Figure 26. The high-grade Zn domain in green, the white outline is the entire tailings model outline

When the Zn distribution described in figure 24 was spilt using this high-grade domain, the sample distributions show much better normal distribution curves figure 27 and 28 respectively.

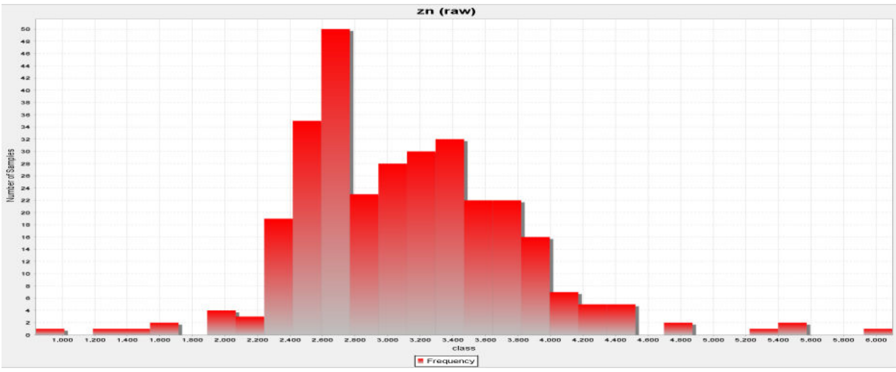


Figure 27. The sample distribution inside high-grade Zn domain

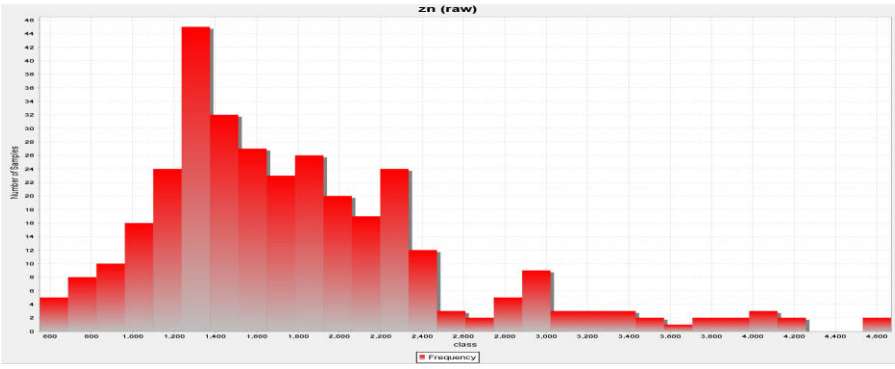


Figure 28. The sample distribution outside high-grade Zn domain

Variography

Variography was conducted for the primary estimated elements in the two domains presented in the previous section. since Cu is the main product most of the emphasis was assigned to this modelling. Variogram modeling was done using Surpac 2021 variogram modelling tools to establish grade continuity parameters for block modeling.

Modeling for both domains produced relatively good variograms. The grade continuity showed expected directions and continuity for the style of the deposition of the tailings. It is known that the tailings material was deposited to the north of the facility and the material has been flowing towards south. The continuity in horizontal direction was high and vertical direction low.

The best continuity for the tailings domain was found to be in the direction 130 degrees with 0 dip and range of 200 meters, semi major direction was less well defined and minor continuity was basically obsolete as expected. Figure 29.

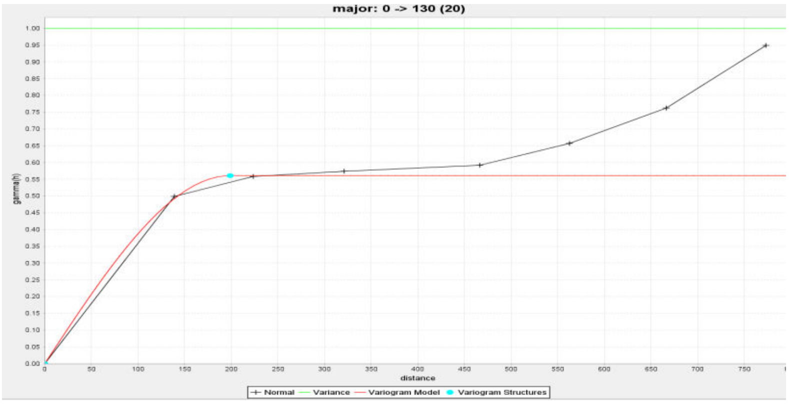


Figure 29. Major variogram of the main domain

A separate variogram was calculated for Zn in the high-grade Zn domain. The best continuity was found to be the direction of 70 degrees. The best continuity had the range of 180 meters, which is bit less than the other model. In this domain the semimajor variogram was a bit better defined and the minor variogram was also basically obsolete (figure 30.)

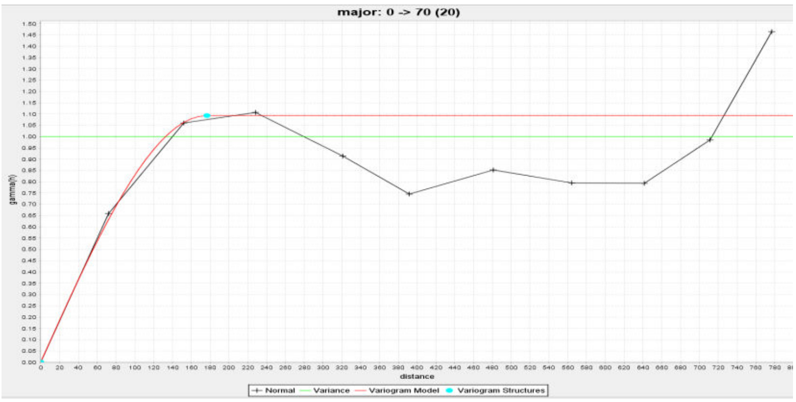


Figure 30. Major variogram of the main domain

It is unclear why the orientation in the high-grade zinc domain is in a different direction. Possible reasons are that the material was deposited from the eastern side of the tailings pond and was flowing more to the east. This direction was used to model Zn grade inside high grade zinc domain.

Table 5. Estimation parameters derived from the variograms

Domain	tailings	HGZN
max search radius	200	180
major/semi-major	1	1.8
Major/minor	3	5
Bearing	130	70
plunge	0	0
dip	0	0

Block Modelling

Viscaria tailings block model was created using Surpac 2021 blockmodeling tools. The extents were defined by the outline of the tailings facility and estimated depth of the facility. The model was not rotated, since the tailings facility in in north south position and the drilling grid is almost perpendicular to this.

Block size was determined to be 25m x 25m x 2 m (xyz). Which is ¼ of the drilling density. The z direction was set low in order to respect the deposition style, where thin layers of material was deposited to the tailings pond.

The surface of the tailings facility is sloping towards the south. In order to model the surface as close as possible, the sub-blocking was set to 6.25m x 6.25 m x 0.5m

The summary of the block model parameters is presented in table 6.

Table 6. The summary of the block model parameters

Type	Y	X	Z
Minimum Coordinates	7529534.712	144402.427	490
Maximum Coordinates	7531059.712	145777.427	530
User Block Size	25	25	2
Min. Block Size	6.25	6.25	0.5
Rotation	0	0	0

Attribute Name	Background	Description
ag	-999	Silver
as	-999	Arsenic
au	-999	Gold
au_cut	-999	Top cut Gold
bd	-999	bulk density
classification		Resource classification
co	-999	Cobalt
compaction	-999	compaction_factor
cu	-999	Copper
cu_cut	-999	Top cut Copper
depth	0	Depth of the block
pore_volume	-999	Pore volume
s	-999	Sulphur
sg	-999	Spesific grafity
v	-999	Vanadium
vol_adjust	-999	volume adjustment
zn	-999	Zinc
zn_cut	-999	Top cut Zinc

Estimation

The estimation method was selected to be inverse distance weighed (IDW). The selection is based on the sample data. The samples are evenly distributed and IDW is a suitable method for modelling such dataset.

The estimation was conducted in several phases, using the obtained parameters from the variogram modeling. These parameters are described in chapter variogram modeling. The high-grade Zn domain was estimated in a single pass, but the main tailings domain was estimated in two passes. In the first pass the parameters from the variogram modeling were used. The second pass used the direction and anisotropy factors, but the search distance was set to 500m in order to fill all blocks inside the domain. The grades estimated in the first pass and the second pass were separated and a classification was assigned to distinguish the areas using different search distance.

The modeling produced plausible results, where highest grades are estimated in the northern part of the deposit. This is since the discharge points were most likely located in these areas. The largest and the densest particles were first to deposit, whereas lighter particles continued further in suspension and deposited into the southern part of the pond. This is clearly seen for example in the Cu distribution in the pond (figure x).

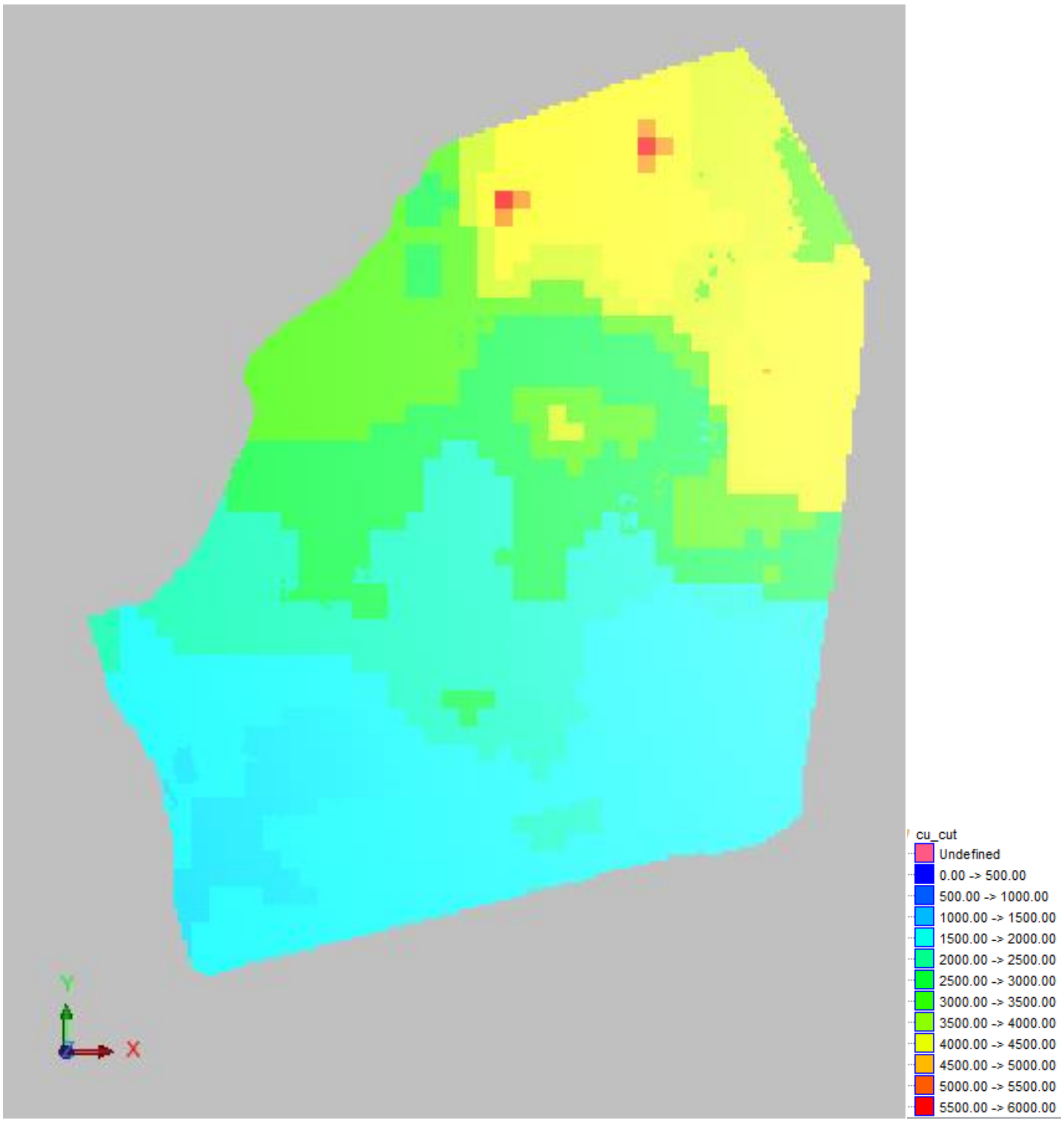


Figure 31. The Cu distribution inside the tailings facility

Density estimation was carried out using the same parameters as in the main tailings domain. Density was measured by pycnometer as the mineral grain density and with constant size sample method pores filled with water. Both of these parameters were estimated in the block model.

From the two density measurements, an estimation of the pore volume was calculated for each block in the block model. Since the nature of tailings, it is assumed that the surface parts of the tailings will have more pore volume than the deeper parts. In order to take this into account a compaction factor was calculated. The compaction factor reduces the pore volume by 1% each meter. Since the planned production will focus on the dry density tonnes, the pore volume subjected to compaction factor was used as a volume adjustment in reporting the tonnes and grades.

The result was confirmed using a mass balance calculation. It is known that during the operation of Viscaria and Pahtohavare mines a total of Viscaria Mine produced 14.07 Mton ore. This ore was concentrated in Viscaria concentrator, and the tailings were deposited into the Viscaria Tailings facility. In total 1.15 Mton of concentrate was produced and sold from Viscaria. Therefore, the total tonnage deposited into the tailings facility is estimated to be 12.92 Mt. The total tonnage inside the tailings 3D model was 12.7 million tonnes, which corresponds well to the estimated material inside the tailings facility. The figure is expected to be smaller than the deposited material, due to conservative modelling procedure.

Validation

The results of the block modeling were validated by visual validation of the original data from the drillholes against the final modelled grade from the block model. The grade in the drillholes match well with the modelled grade. The down dip changes seem to be modelling correctly in the model and present well the depositing model, where thin layers of material are deposited on top of the old layers when the tailings were inserted to the pond. This rapid change is clearly visible in figure 32.

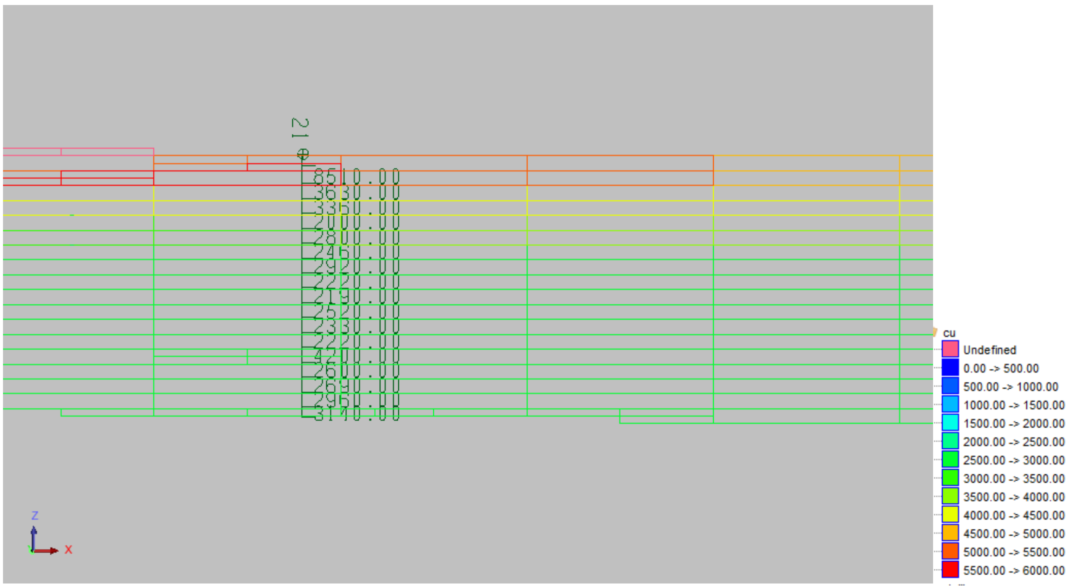


Figure 32. The visual inspection of drillholes against block model. Cu in both drillhole and block model.

In some parts the changes in depth were not so rapid. These areas were also modelled correctly as seen in figure 33.

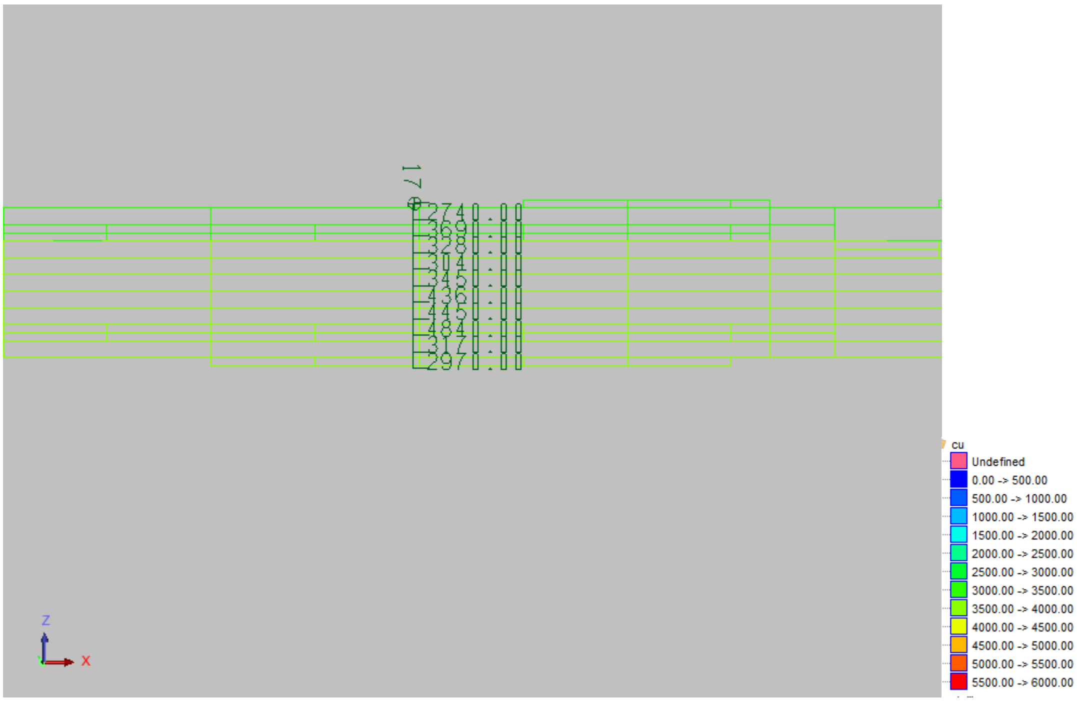


Figure 33. The visual inspection of drillholes against block model. Cu in both drillhole and block model.

Also, swath analysis was performed for the Cu grade. Two different analyses were created. The first analysis was conducted from south to north. In figure 34 it is clearly seen that the Cu grade increases towards the north. This was considered to be caused by the deposition of tailings in the north part of the tailings facility. In the graph, a smoothing effect can be detected. The grade of the Block model is slightly higher than the composite grade, except in the northern part, where the composite is higher. Smoothing is typical in block modelling, especially when samples are located fairly far away from each other.

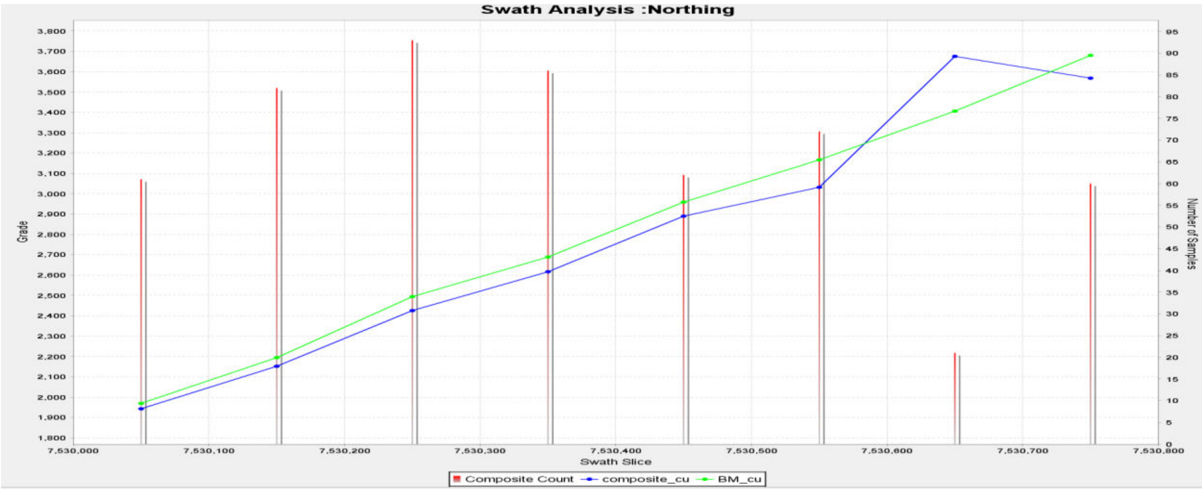


Figure 34. Swath analysis for Cu by northing.

The larger variation of the grade was estimated to be in the down dip direction of the model. Therefore, a second swath analyses was conducted by elevation. This plot show that the variation is fairly well represented in the block model. Block model show more grade in the elevation between 514 to 518. This was estimated to be caused by the southern part of the tailings facility, where in fairly large area there is no drilling as explained previously.

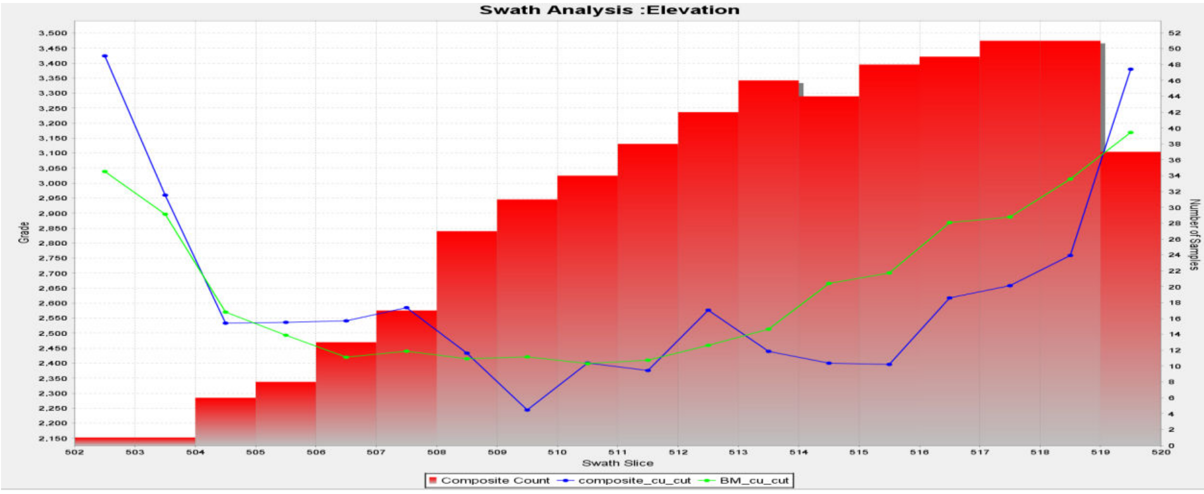


Figure 35. The swath analysis by the elevation.

Cut-off grade

Based on the accessibility (minerals already piled up on the ground for excavation and easy preparation for re-grinding and flotation), long-term experience in combination with current commodity prices (9,900 USD/ton Cu), the company views a cut-off of about 0.06% Cu to being justified in the case of mineral resources in the tailings.

Classification

The classification of the resource is based on the modelling parameters. The modelling was conducted in two phases. First phase was estimated using the parameters from the variogram modelling. The second round was estimated using a larger search distance than suggested by the variograms. The second round was estimated to fill all the blocks that were not estimated during the first round.

All the blocks estimated in the first round were classified as measured resources. The blocks estimated in the second round, were classified as indicated resource.

Metallurgical test work

Amenability flotation tests have been conducted by Oulu Mining School (OMS) in Finland. Samples for these tests included material from the uppermost 5m part of the tailing deposit containing an average content of Cu of 0.58%. Results of the test included a mineralogical textural investigation of the feed and new tailings. This has given insightful information for further detailed lab scale metallurgical tests (currently in progress at OMS).

Results from the amenability test signals Cu recoveries by flotation of 62.8%

From statistical revisions of the tailing geochemical data, it is noted that in addition of Cu contained in copper sulphide (chalcopyrite) other elements such Ag (figure 36), Au and Co might be reported in the copper concentrate as they seem to have good correlations with Cu. An ongoing lab scale metallurgical test will clarify these correlations. The Oulu flotation test indicated that Co achieve 1400ppm in the Cu concentrate.

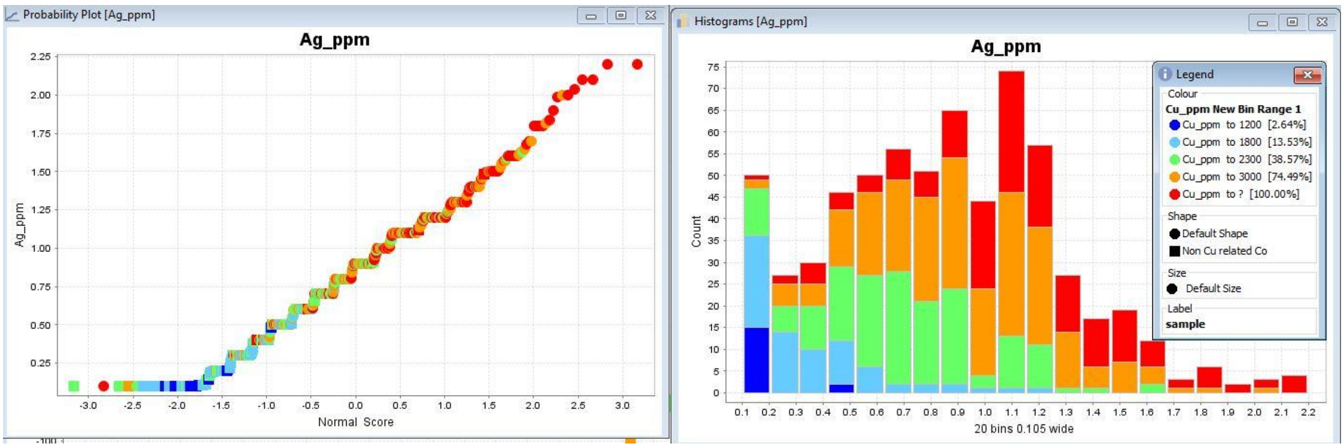


Figure 36. Ag correlation to Cu

Economic viability

Within the mining industry, the recycling era is in its bud, and expected to grow alongside with society´s quest for sustainability. Further to the background, the copper price has increased by 5.5 times since the Viscaria mine was closed in the late 1990´s, providing genuine potential for an easing of the environmental liability while at the same time providing economical potential.

Copperstone concludes that the Remining project initially can be expected over a 10-year life-of-mine amounting to 600,000 tons production per year, starting off from the northern copper richer parts. Copperstone´s conclusion (based on local quotations on logistics, current tailings tonnages, grades and recovery rates and 9,900 USD/ton copper) is that Remining is *expected to perform substantial revenues* (999 MSEK corresponding to almost 20 USD/ton milled ore) *and significant profitability* if production takes place at the Viscaria plant.

In addition, economically viable production in the case of external enrichment is expected if transportation is conducted by rail or engaged in large-scale truck logistics (exemption for 90-ton trucks assumed) to a site elsewhere in Norrbotten. The purpose for such a set up would be to be able to remine also during the time from an approval of the environmental permit and the completion of the processing plant construction in Kiruna. Smaller (74 ton) trucks are today not considered a viable option for economically viable external enrichment, unless the commodity prices surge further.

On top, the Company foresees a reasonable potential for credits from by-products (such as gold, zinc, silver, cobalt, vanadium or scandium), which at this stage is viewed as a “bonus” for both the project economy and nature.

Resource Statement

The total resource was estimated as pictured in previous chapters, in total of 12.7 Million tonnes. @ 0.27% Cu, 0.45 ppm Ag, 0.06 ppm Au, 145 ppm Co and 0.24% Zn. All above the 0.06% or 600 ppm cutoff. The resource can produce 34 Kt of copper and 30 kt Zn in addition of au, ag and co, which are expected to be recovered in the copper concentrate. The resource statement is presented in table 7.

Table 7. Mineral resource statement

Classification	Tonnes	Cu (ppm)	Ag (ppm)	Au (ppm)	Co (ppm)	Zn (ppm)
Measured	12544335	2 707	0.88	0.06	145	2 418
Indicated	164048	1 698	0.45	0.05	146	1 889
Measured+indicated	12708383	2 694	0.87	0.06	145	2 412

Table 8. Metals contained in the mineral resources

Classification	Tonnes	Cu (kt)	Ag (t)	Au (t)	Co (kt)	Zn (kt)
Measured	12544335	34.0	11.0	0.8	1.8	30.3
Indicated	164048	0.3	0.1	0.0	0.0	0.3
Measured+indicated	12708383	34.2	11.1	0.8	1.8	30.7

Conclusions

The estimated tonnage compares well with the reported production of ore and concentrate from the Viscaria and Pahtohavare mines, with that said, the 12.7 Mtonnes is a well-founded tonnage.

The estimation of grades can likewise to be made in an appropriate way and the validation of block model data against composited raw data compares well.

Based on the metallurgical testwork a recovery of 62.8% of the copper is expected. This is probably a bit high, the testwork is based on a sample with 0.58% Cu, which is approximately double that of the average contents in the tailings dam. It is a common fact that recovery is grade dependent, and that lower grades in the feed implies lower recoveries. On-going testwork at the Oulu School of Mines will give results for the construction of a graph describing recovery as a function of grade in the feed.

The overall economical result of the Remining project is indeed promising, 999 MSEK in accumulated cash flow over a period of 10 years, while at the same time removing a potential environmental liability, is indeed a good result. Only the contents of Cu have been considered in this evaluation, no credits for other value metals have been considered.

The risks associated with the project are considered to be low, the tonnages and grades are finite but known, the expected recovery of Cu is probably slightly overestimated but still within reason, the metal price (Cu) is most likely to go up with the present trend to electrify the transport sector.

It is recommended that the next step of this project is to complete a Definitive Feasibility Study.

Appendix 1

Table 1 Part 1 - Reporting of Exploration Results		
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 are 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 tailings was completed in order to report resources inside Viscaria mine tailings facility. This is the first resource report conducted from the tailings.
Project Outline	Brief description of key technical factors that have been considered	No technical factors have been considered in this mineral resource report, since no mineral reserve have been defined
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.	Viscaria Mine produced 14.07 Mton ore. This ore was concentrated in Viscaria concentrator, and the tailings were deposited into the Viscaria Tailings facility. In total of 1.15 Mton of concentrate was produced and sold from Viscaria. The difference, 12.92 Mtonnes, can be expected to be deposited in the tailings dam.

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 tailings area of the Viscaria Copper Project (the project) is located in Kiruna municipality (population 23,500), in Norrbotten County, Sweden, approximately 150 km north of the Arctic Circle. The project lies approximately 5 km northwest of the city of Kiruna. Project is located 345 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	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 -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.
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 mineralogy of the deposit resembles the mineralogy of the Viscaria mine zone A, since most of the production originates from this orebody. A smaller portion of the resources originates from Pahtohavare mine close by.
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 Viscaria AB is the proprietary owner of the exploration permit Viscaria East in Kiruna municipality, covering the old tailings dam through its 211.9 hectares. Copperstone Viscaria AB is, in addition hereto, in the process of applying for an exploitation concession according to the Swedish Mineral´s Act. The landowner is Statens Fastighetsverk “SFV” (100% owned by the Swedish state), and other stakeholders in the vicinity are, among others, Kiruna municipality, Laevas and Gabna reindeer herders, Friluftsfrämjandet/Ädnamvaara recreational area, Kurravaara 4:3, Ön 1:1, six windmill turbines, LKAB, Trafikverket and Försvarsmakten.

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 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.	Copperstone Viscaria AB´s three granted exploitation concessions under the Minerals Act (SFS1991: 45) are as follows; Viscaria K no 3 and K no 4 which were granted by *Bergsstaten* (Eng: Mining Inspector) in January 2012 and Viscaria K no 7 which was granted by *Bergsstaten* (Eng: Mining Inspector) in March 2018. Copperstone Viscaria AB has been awarded a 25-year land lease from the County Administration Board of Norrbotten (not including Viscaria no 7), which has been appealed to the Swedish Government. The land lease is still valid, and will be so up and until the Government´s final decision. Copperstone Viscaria AB in addition hereto, has applied for a new land lease, this time including Viscaria no 7 exploitation concession

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.	Described in previous section
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	This report was produced by Copperstone Resources AB personnel in close communication with the Competent Person. All participated personnel are listed in the report.

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 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.	Sampling was conducted using rotary auger drilling. Sampling was done in 1m intervals (except two earlier holes, which were sampled in 0.5m intervals. Half of the auger sample was collected. For duplicate samples the second half was also collected. Sampling was done in vertical holes, spaced 100m from each other as a grid. Wet mud samples were retrieved from the auger manually and stored and labelled in plastic bags in situ.

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.	The sampling was conducted using rotary auger drilling with a GM75 rig. The diameter of the auger bit was 82 mm.
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).	No variations in sample recovery were observed during drilling.
Logging	Whether samples have been logged to a level of detail to support appropriate Mineral Resource estimation, 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.	Due to the nature of the homogenic sample material, no logging was performed. Only grade variation and analysis has been used to determine subdomains in the deposit. Records of the upper and lower contact of the tailing deposit were annotated. The top contact of the tailing deposit is covered by a thin layer of organic material (less than 0,5m). The bottom contact of the tailing deposit is marked by the transition into the till material.
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).	No other sampling techniques were used.

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	

Assay data and laboratory investigation	The 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.	Tailing samples were prepared and analyzed following the following procedures in ALS Global, ME-ICP41 (aqua regia digestion), Au-AA23 Fire assay Fusion. preparation followed OA GRAd05s. Organic content and moisture content were determined by C-IR06a
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.	One twinned hole was drilled close to a pre-existing hole in order to confirm the layered structure of the deposit

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.	Collar coordinates were surveyed with handheld gps and elevation was checked against lidar measurement of the area.
Data density and distribution	A statement should be included as to whether the data to which this is known, considering the deposit type should be stated 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 data was acquired in a 100mx100m grid. The southern part of the tailings facility was inaccessible due to ground conditions. One area was drilled with approximately 60m grid in order to study grade continuity. Sampling is conducted perpendicular to deposited beds of tailings. The samples were composited in the estimation process
Reporting Archives	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) for preparing the report should be provided.	All data has been stored in Copperstone Resources AB servers. This data includes all digital data created for preparing this resource estimate
Audits or reviews	The results of any audits or reviews of sampling techniques and data should be presented and discussed.	No audits have been conducted at this stage of the process

Table 1 Part 3 - Reporting of Exploration Results

Criteria	PERC Code explanation	Commentary
Reporting exploration results		No exploration results has been reported in this mineral resource 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.	An Access database was created specifically for this modelling process. The database was checked for missing assays, collar coordinates and duplicate entities.
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 interpretation was done using available lidar and drilling data. The extents of the tailings facility is well known and the reliability of the model is good.

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 data to 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 (section, polygon, inverse distance, geostatistical, of 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	The estimation was conducted using inverse distance squared method (IDW). The method was chosen since the sample grid is uniform and unclustered. After statistical evaluation of the data grade capping was conducted, and a subdomain was created. The data was composited into 1 m composites using Surpac compositing tools. An ellipsoid search radius was used, and the distances were determined from variograms. Maximum search distance was 200 meters using minimum samples of 5 and maximum samples of 15. Inverse distance power 2 was used. Most of the blocks were estimated using these parameters, a second round was estimated and in order to fill the rest of the blocks, a 500m search distance was used. Due to ground conditions the southern part of the deposit was extrapolated. The modeling was validated visually and using swath plots. A mass balance calculation from existing data was produced. Block size 25mx25mx2m was selected from the drilling density and to represent the deposition style of the deposit. 25m equals ¼ drilling density. The estimation was constrained inside modelled tailings model.

	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.	

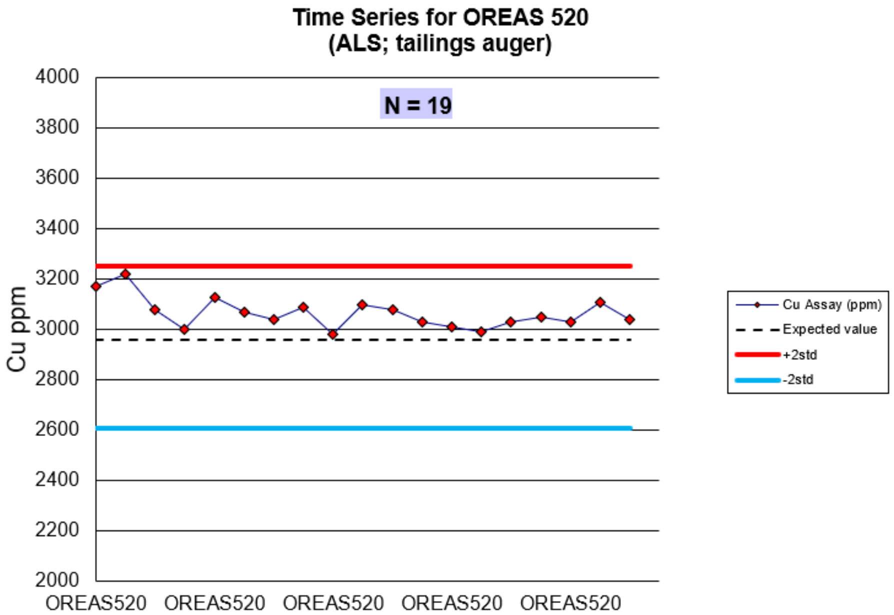
Metal equivalents or other combined representation of multiple components	The following minimum information should accompany any report which includes reference to metal equivalents (or other component equivalents) in order to conform with these principles. It is necessary to identify: 1. individual 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.	All metals and elements were estimated and reported separately, no equivalents were used.

Cut-off grades or parameters	The basis of the cut-off grades or quality parameters metal formulae. The cut-off parameter may be economic value per block rather than grade. applied, including the basis, if appropriate, of equivalent	Based on the accessibility (minerals already piled up on the ground for excavation and easy preparation for re-grinding and flotation), long-term experience in combination with current commodity prices (9,900 USD/ton Cu), the company views a cut-off of about 0.06% Cu to being justified in the case of mineral resources in the tailings.
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.	The bulk density was determined from selected drillholes with two different methods, pycnometer and standard volume Archimedes method. The measurements were conducted for six holes, selected to best represent the whole area. The calculation of the density is better explained in the report.
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.	No mining methods were evaluated at this stage of the process.

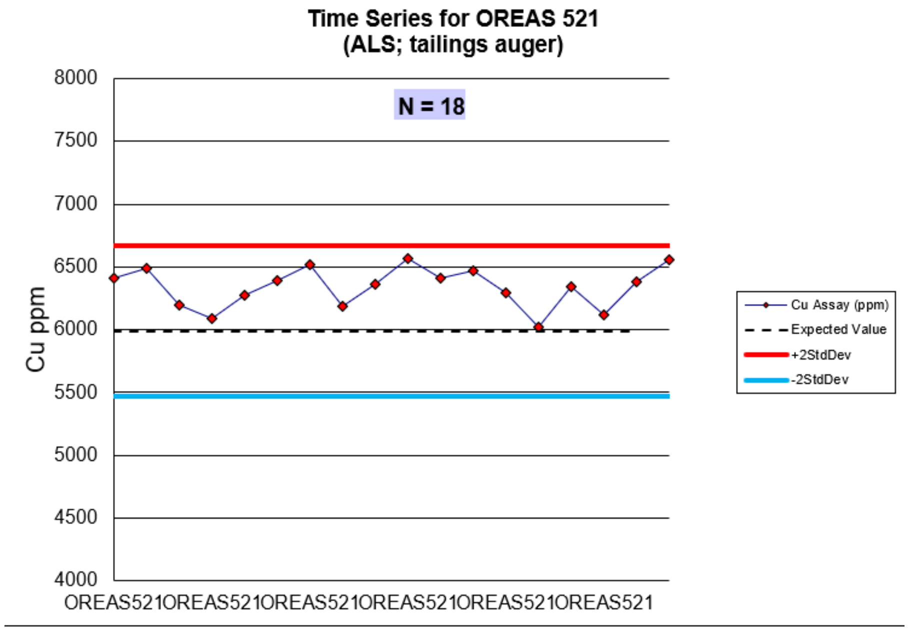
Metallurgical factors or assumptions	The metallurgical process proposed and the appropriateness of that process to the style of mineralisation. It may not always be possible to make detailed assumptions regarding metallurgical treatment processes when reporting Mineral Resources. In order to demonstrate 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 recognized, and suitable process steps included in the flowsheet.	Amenability test for Cu floatation have been performed by OMS. An ongoing lab scale metallurgical test work is taking place to assess the recoveries of Cu, Ag , Au and Co contents by flotation.
Others	Any potential impediments to mining such as land access, environmental or legal permitting. Location plans of mineral rights and titles.	

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.	The classification of the resource is based on the modelling parameters. The modelling was conducted in two phases. First phase was estimated using the parameters from the variogram modelling. The second round was estimated using a larger search distance than suggested by the variograms. The second round was estimated to fill all the blocks that were not estimated during the first round. All the blocks estimated in the first round were classified as measured resource. The blocks estimated in the second round, were classified as indicated resource
Audits or reviews	The results of any audits or reviews of sampling techniques and data should be presented and discussed. of Mineral Resource estimates.	No audits have been conducted at this stage of the process
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.	
Schematic description of the principles for reporting of Mineral Resource and Mineral Reserve		Reported in the body of the report

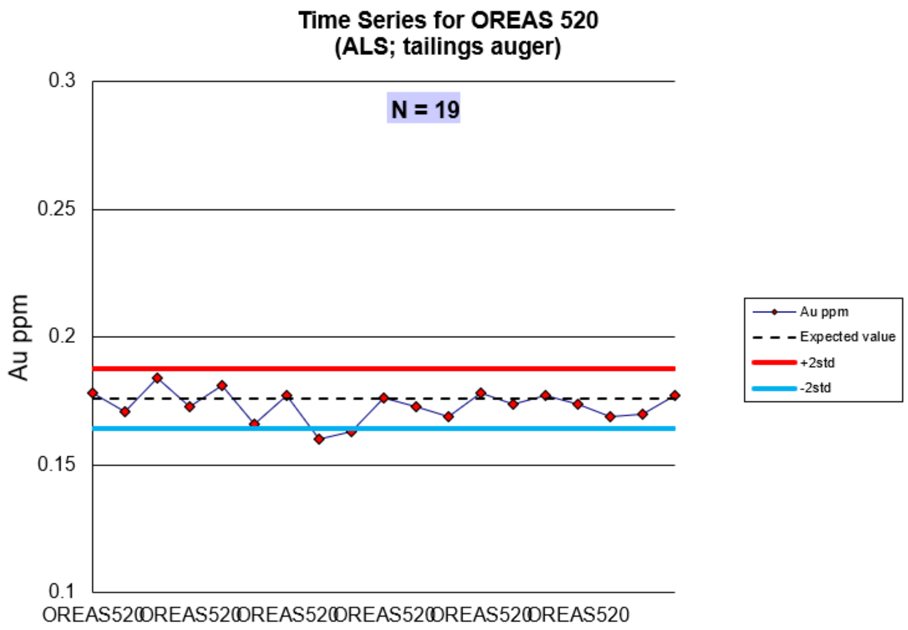
Appendix 2

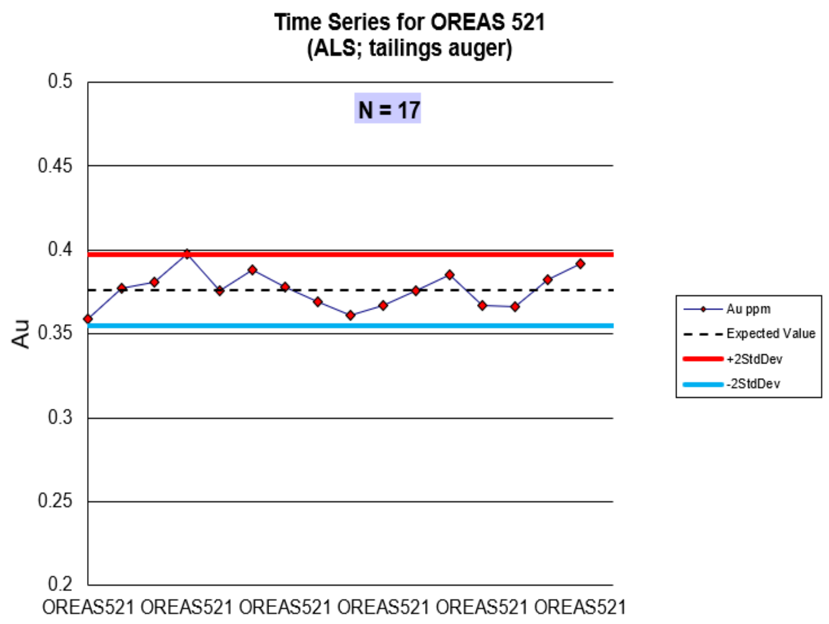


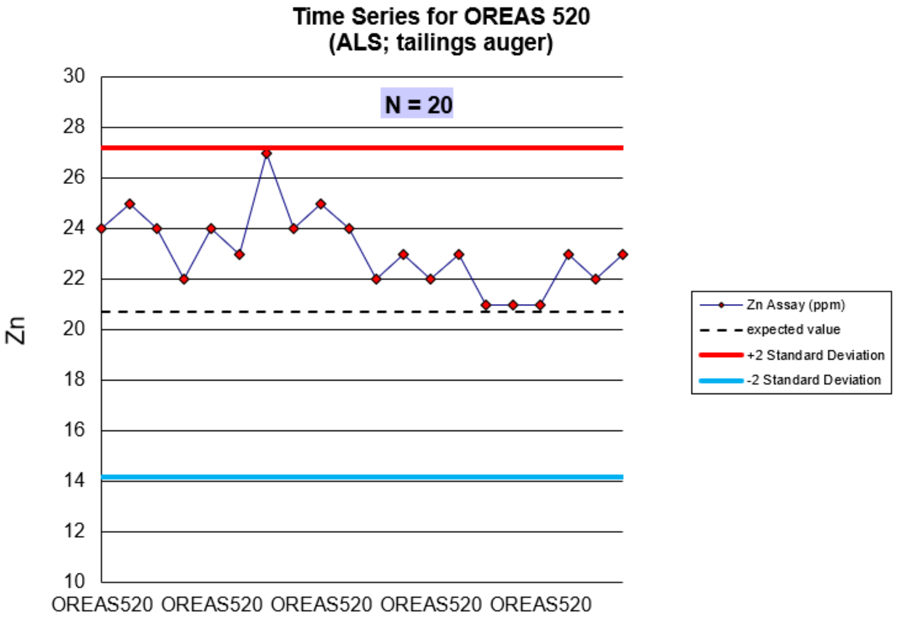
Time Series for OREAS 520
(ALS; tailings auger)
N = 19
Cu ppm
4000
3800
3600
3400
3200
3000
2800
2600
2400
2200
2000
OREAS520
OREAS520
OREAS520
OREAS520
OREAS520
Cu Assay (ppm)
Expected value
+2std
-2std

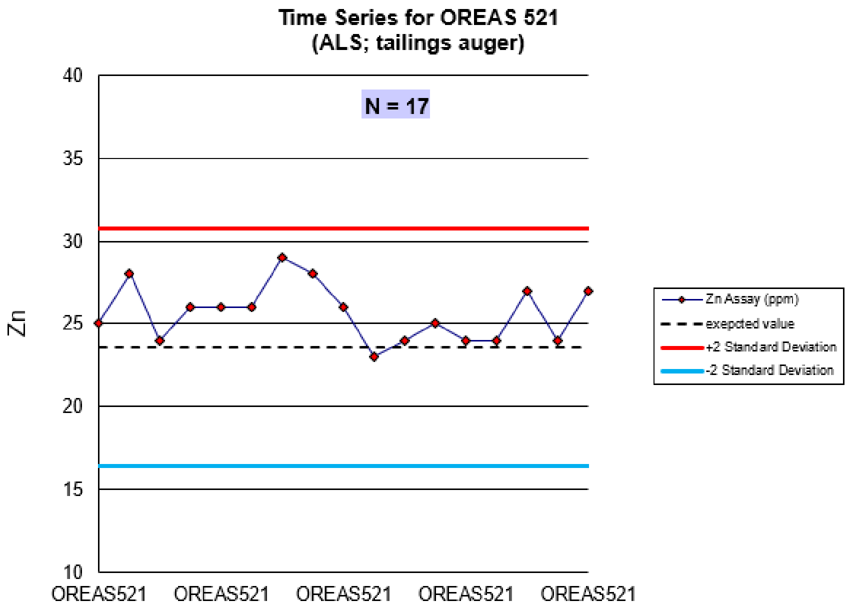


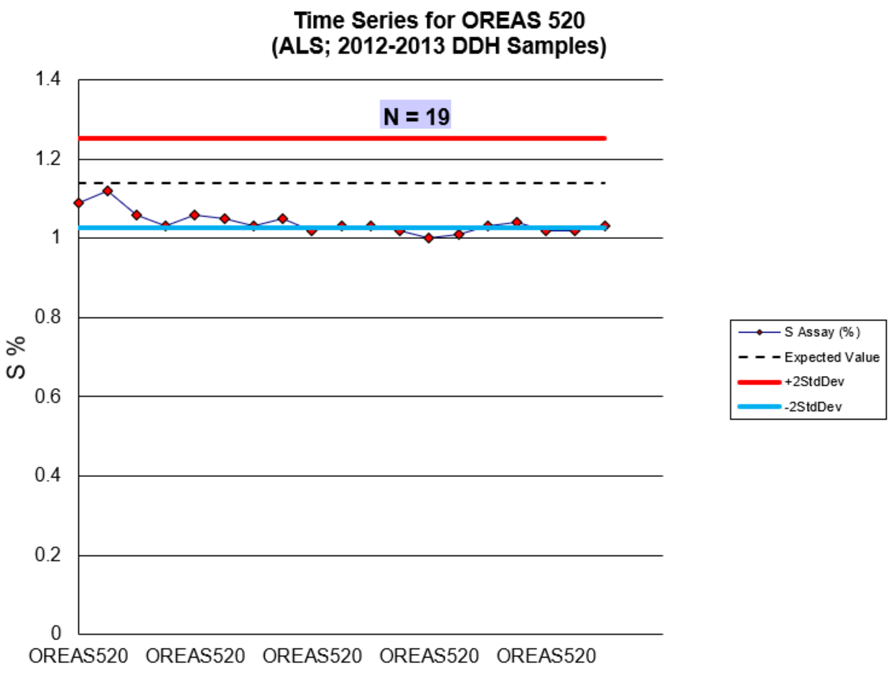
Time Series for OREAS 521
(ALS; tailings auger)
N = 18
Cu ppm
8000
7500
7000
6500
6000
5500
5000
4500
4000
OREAS521OREAS521OREAS521OREAS521OREAS521OREAS521
Cu Assay (ppm)
Expected Value
+2StdDev
-2StdDev

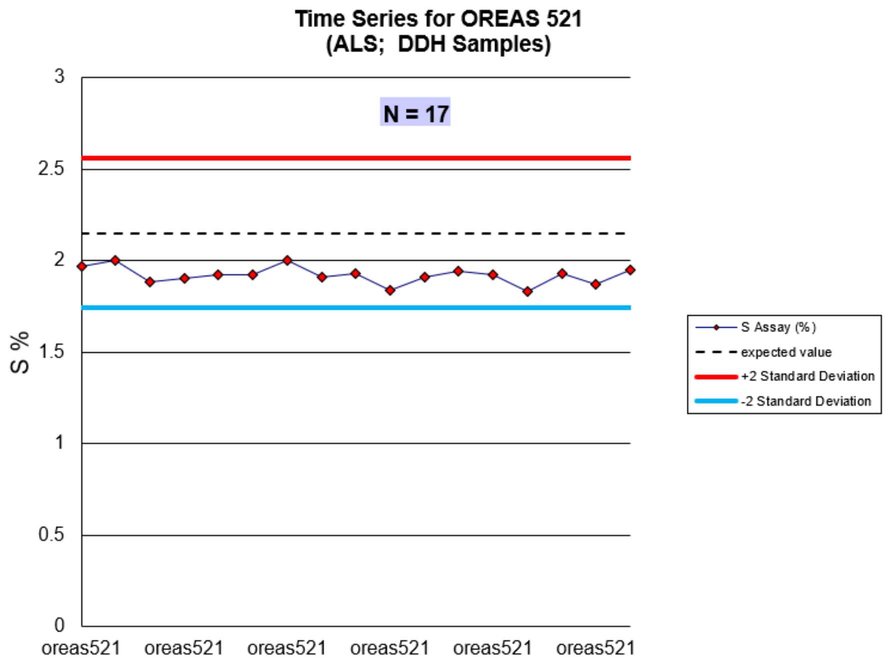

Time Series for OREAS 520
(ALS; tailings auger)
N = 19
Au ppm
0.3
0.25
0.2
0.15
0.1
OREAS520 OREAS520 OREAS520 OREAS520 OREAS520 OREAS520
Au ppm
Expected value
+2std
-2std

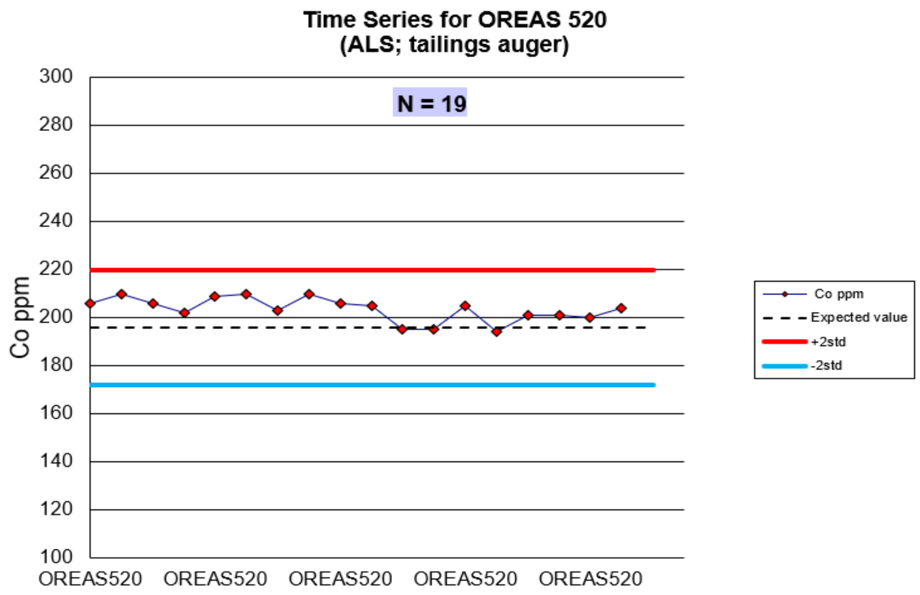

Time Series for OREAS 521
(ALS; tailings auger)
N = 17
Au
0.5
0.45
0.4
0.35
0.3
0.25
0.2
OREAS521 OREAS521 OREAS521 OREAS521 OREAS521 OREAS521
Au ppm
Expected Value
+2StdDev
-2StdDev

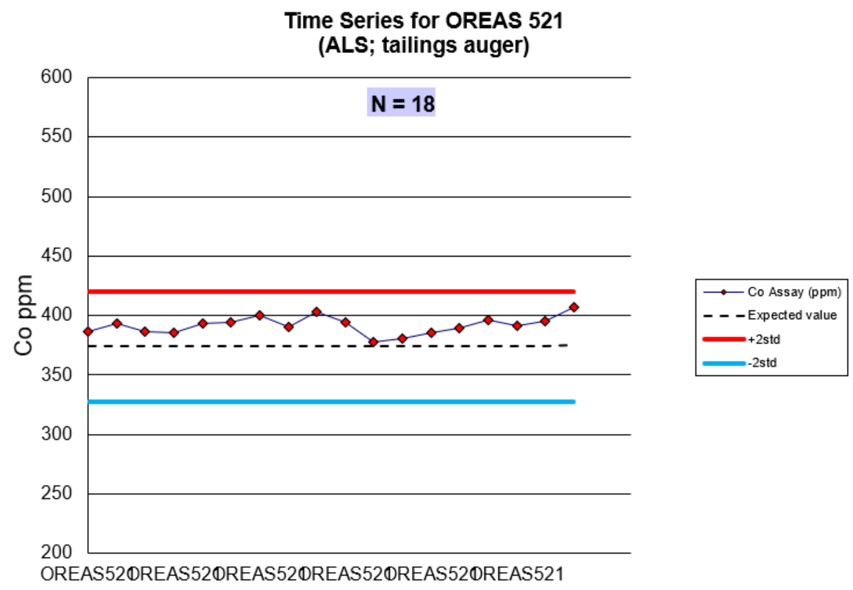

Time Series for OREAS 520
(ALS; tailings auger)
N = 20
Zn
30
28
26
24
22
20
18
16
14
12
10
OREAS520 OREAS520 OREAS520 OREAS520 OREAS520
Zn Assay (ppm)
expected value
+2 Standard Deviation
-2 Standard Deviation

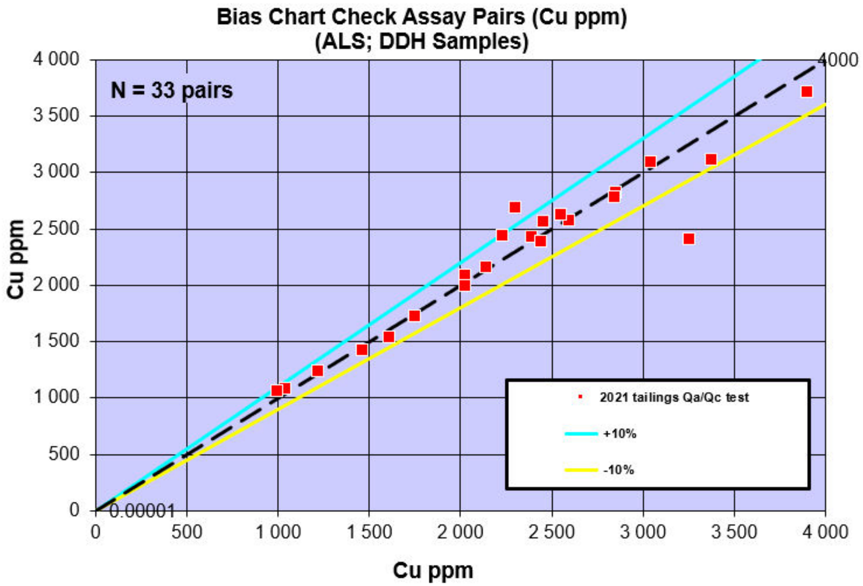

Time Series for OREAS 521
(ALS; tailings auger)
N = 17
Zn
40
35
30
25
20
15
10
OREAS521 OREAS521 OREAS521 OREAS521 OREAS521
Zn Assay (ppm)
exepcted value
+2 Standard Deviation
-2 Standard Deviation


Time Series for OREAS 520
(ALS; 2012-2013 DDH Samples)
N = 19
S %
1.4
1.2
1
0.8
0.6
0.4
0.2
0
OREAS520
OREAS520
OREAS520
OREAS520
OREAS520
S Assay (%)
Expected Value
+2StdDev
-2StdDev

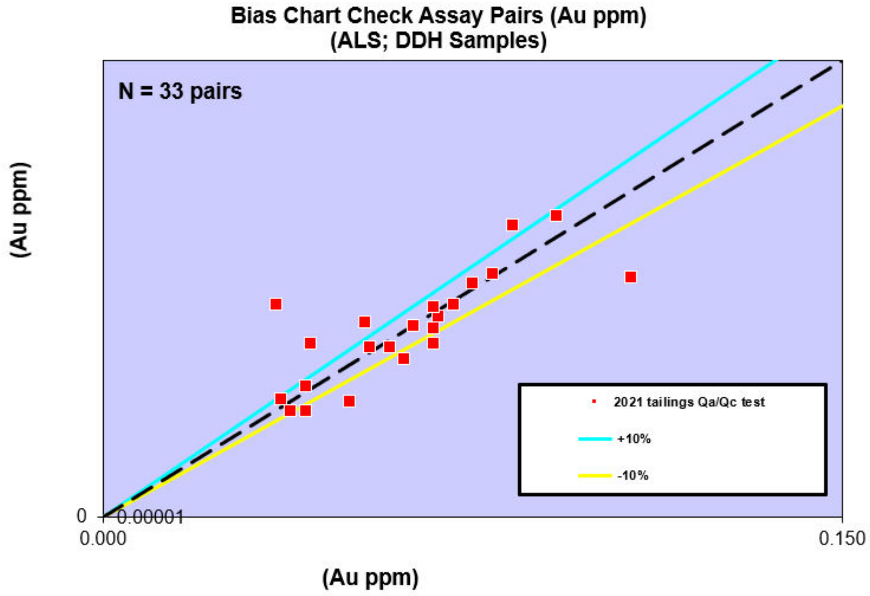

Time Series for OREAS 521
(ALS; DDH Samples)
N = 17
S %
3
2.5
2
1.5
1
0.5
0
oreas521
oreas521
oreas521
oreas521
oreas521
oreas521
S Assay (%)
expected value
+2 Standard Deviation
-2 Standard Deviation


Time Series for OREAS 520
(ALS; tailings auger)
N = 19
Co ppm
300
280
260
240
220
200
180
160
140
120
100
OREAS520
OREAS520
OREAS520
OREAS520
OREAS520
Co ppm
Expected value
+2std
-2std

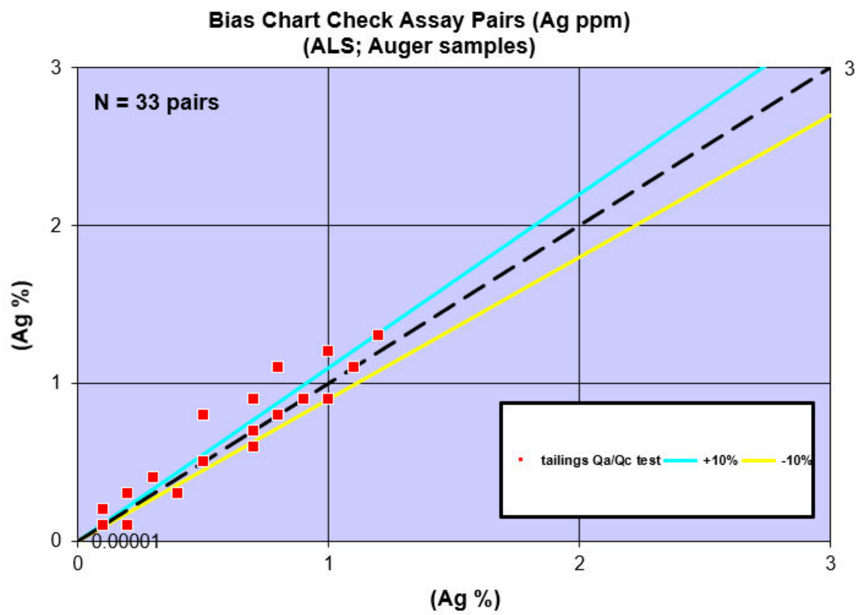

Time Series for OREAS 521
(ALS; tailings auger)
N = 18
Co ppm
600
550
500
450
400
350
300
250
200
OREAS521
OREAS521
OREAS521
OREAS521
OREAS521
OREAS521
Co Assay (ppm)
Expected value
+2std
-2std

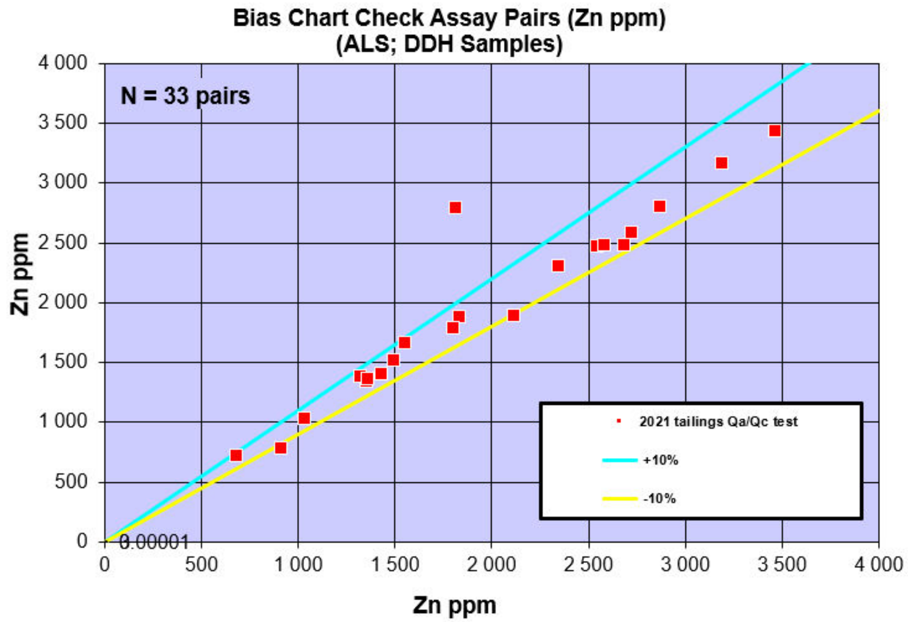


Bias Chart Check Assay Pairs (Cu ppm)
(ALS; DDH Samples)
N = 33 pairs
2021 tailings Qa/Qc test
+10%
-10%
0.00001
4000
Cu ppm
Cu ppm
0
500
1 000
1 500
2 000
2 500
3 000
3 500
4 000



Bias Chart Check Assay Pairs (Au ppm)
(ALS; DDH Samples)
N = 33 pairs
2021 tailings Qa/Qc test
+10%
-10%
0
0.00001
0.000
0.150
(Au ppm)
(Au ppm)


Bias Chart Check Assay Pairs (Ag ppm)
(ALS; Auger samples)
N = 33 pairs
(Ag %)
(Ag %)
tailings Qa/Qc test
+10%
-10%
0.00001
0
1
2
3


Bias Chart Check Assay Pairs (Zn ppm)
(ALS; DDH Samples)
N = 33 pairs
Zn ppm
Zn ppm
2021 tailings Qa/Qc test
+10%
-10%
0.00001
0
500
1 000
1 500
2 000
2 500
3 000
3 500
4 000