# Universidad Católica del Norte Magíster en Geometalurgia

# Auditoría en Geometalurgia de Proyectos

5 y 6 de Mayo 2023

#### Introducción

Se presenta un extracto de un informe de auditoría, mostrando sus aspectos clave.

## Contenido del Reporte

#### CONTENTS

1.0	EXECUTIVE SUMMARY1-1			
2.0	PROJECT DESCRIPTION			
	2.1 Introduction			
	2.2	Scope	of Work	2-1
3.0	CEOM	2.1		
3.0	GEOMETALLURGICAL DATA			
	3.2		ng, Preparation and Metallurgical Testing	
	3.3		for Geometallurgical Data	
			_	
4.0		4-12		
	4.1		ction	
	4.2		ical Units	
	4.3	Estimat	tion Database	4-19
	4.4	Commi	nution	4-21
		4.4.1	Exploratory Data Analysis (EDA)	4-21
		4.4.2	Interpolation Plan and Setup	4-38
		4.4.3	Block Model Validation	
		4.4.4	Global Statistics	4-48
		4.4.5	Swath Plots	
	4.5	Flotation		
		4.5.1	Exploratory Data Analysis (EDA)	
		4.5.2	Interpolation Plan and Setup	
		4.5.3	Block Model Validation	
		4.5.4	Global Statistics	
		4.5.5	Swath Plots	
5.0	CONCLUSIONS AND RECOMMENDATIONS5-1			
6.0	REFERENCES6-1			

### **Executive Summary (I)**

Currently the project is concluding the PFS_A study level, which is the first stage
of a Pre-Feasibility study according to internal report and study nomenclature. The deposit is a large, high-grade, porphyry-style copper deposit and the current assumption is that it will be mined using an underground sublevel stoping method.
The primary objective of the audit was to identify any geometallurgical issues or risks in the study. Where possible, also has provided feedback on potential opportunities.
classified risks for this audit according their potential impact on the Mineral Resource estimate:

- Key Issue: corresponds to a lack of critical information, errors, and/or improper methodologies that will have a material impact on the Mineral Resources. In this context, a material impact means an impact that can be demonstrated or supported, and results in major deviations from the currently-stated result
- Significant Issue: corresponds to a lack of information, data gaps, errors, improper methodologies, lack of data validation or sources of significant risk that could have an adverse impact on the Mineral Resources.
- Minor Issue: reflects modifications that should be made to bring the Project design or operation into closer alignment with industry leading practices and applicable regulations and legislation, or the presence of gaps in the data that can readily be addressed with minor additional work.

### **Executive Summary (II)**

did not identify any key issues following the audit and is of the opinion that the geometalurgical data is adequated.
However, observed some significant issues which could have an important impact to the project if they are not corrected in the next update of the geometallurgical model. understands that will correct these issues during PFS_B as they update the geometallurgical models for the project to include data from around 36,000 m of new drilling. The significant issues identified in 's audit follow:

#### Significant Issues:

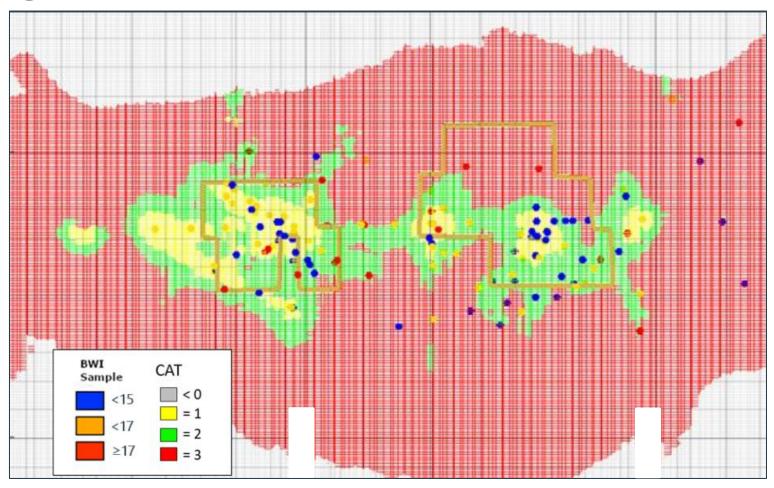
• Clustered Sample Distribution: There are reasonable quantities of comminution and flotation samples, but the sample points are clustered. There are large data gaps within the areas to be mined, a dense cluster of samples within a few stopes and many samples below the area to be mined. In the comminution models it is apparent that a large tonnage is inferred to be hard (>200 min) based on few samples. It is possible that additional sampling in this area could cause a significant shift in the mean hardness for the project. It is also possible that the stoping sequence and ore value per operating hour could be significantly influenced by the harder ore that is currently under-supported.

There are reasonable quantities of comminutes are clustered. There are clustered are clustered. There are clustered are clustered. There are clustered ar

Auditor



### **Significant Issue**



<u>Conclusión</u>: Sección vertical mostrando stopes (caserones) en naranjo. Zonas en inferido e indicado con baja densidad de muestras.

#### Discusión

¿Una auditoría es algo negativo, una molestia para el equipo que desarrolla un proyecto?

¿Debemos enfrentarlas como una amenaza para nuestro trabajo?

¿Existen oportunidades para el proyecto a partir de las conclusiones de una auditoría?

