

EXPLOMIN™ LITHOTYPING

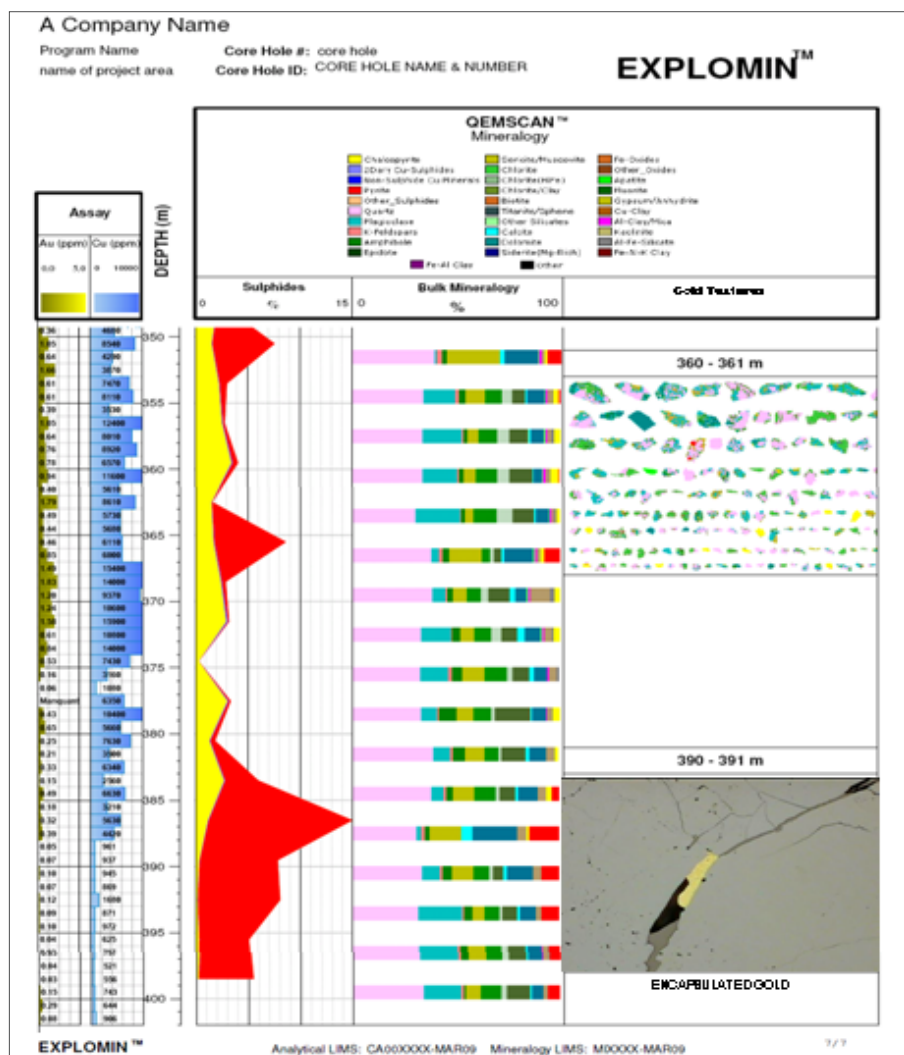
DEFINING DOMAINS FOR MINING AND PROCESSING

EXPLOMIN™ LITHOTYPING is a stand-alone EXPLOMIN™ product which collates and integrates legacy and current logging information, lithological, mineralogical, textural and geochemical data from many sources. The results can be portrayed as downhole log plots, 3-D representations or tabulated digital data suitable for statistical data handling or streaming into a 3-D block model for mining and process planning.

EXPLOMIN™ LITHOTYPING is especially helpful for:

- Defining domains in 2-D (plan or cross-section) or 3-D.
- Assisting with sampling and compositing programs.
- Mapping important detailed textural and mineralogical changes throughout a deposit (i.e. metallurgically significant, environmentally sensitive or known to cause smelter penalties).
- Developing bedrock maps from RC drill chips or geochem rejects in areas where no outcrop exists.
- Combining and validating legacy or regional datasets with new data where nomenclature is suspect or rock names are not well constrained.

EXPLOMIN™ LITHOTYPE is used when EXPLOMIN™ STANDARD data (center area with colored bars) is combined with geochemistry (left- gold and copper, %sulphides) and a wide variety of data from other High Definition Mineralogy techniques. For instance, QEMSCAN particle map analysis might be done on the equivalent samples (top right) or detailed imaging of specific target phases (bottom right) to provide a comprehensive snapshot of the mineralized interval.



WHAT CAN BE ASSESSED?

EXPLOMIN™ LITHOTYPING uses modal mineralogy, grain size and deportment data collected on analytical reject material. It can be combined with almost any digital dataset including:

- Meso and microscale textural characteristics,
- Percent of sulphide minerals,
- Specific mineral information,
- Field alteration or rock-type information,
- Colour index,

- Structural information (such as microfracture density or number of veins per interval, bulk density or downhole log data such as PIMA data, portable XRF data, magnetic susceptibility, or radiometrics),
- Finally, geochemical analyses or parameters calculated from geochemistry can be added to the database to show grade and genesis information.

WHAT MIGHT BE THE OBJECTIVES OF AN EXPLOMIN™ LITHOTYPING STUDY?

- Map and portray zones of recoverable vs. refractory gold to delineate economic domains.
- Guide sampling and compositing programs to select suitable variability samples and perhaps avoid the need for “metallurgical drilling” or taking a bulk sample.
- Delineate domains of textural and mineralogical and grade similarities and portray in 3-D to guide exploration for extensions and expansions.
- Map and sample complex oxide-sulphide transition domains for year-on-year mining and processing applications.
- “Automate” the relogging of legacy core, verify old data and correlate with new interpretations.

WHAT IS THE SAMPLE TYPE?

The EXPLOMIN™ LITHOTYPE package can be done on analytical rejects, pulps and core/rock chips. However, typically, this package is done on analytical rejects. This is because of the key role of textural relationships in the definition of domains and lithotyping.

Analytical rejects are still coarse enough to have inter-grain information preserved so it is possible to see, for example, banded, rimmed or massive textures, interlocking igneous textures, tuffaceous welding, recrystallization textures or cemented sedimentary textures, etc. From data like this, data useful for lithotyping and exploration can be gathered.

A key caveat that must be considered in this package is the “representivity” of the sample. Due to the coarse size of the analytical reject, the aliquot chosen for EXPLOMIN™ LITHOTYPE may not be representative of the primary sample or, more specifically, the geochemical analysis for a given core interval.

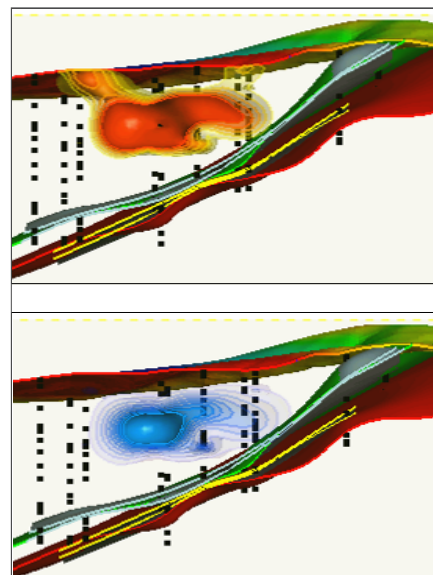
Use of the reject is a “best compromise” position. Obviously analytical pulp is

most representative of a geochemical analysis, but typically textural information is obliterated because the pulp is finely ground. Replicate analysis of the sample puck show that EXPLOMIN™ LITHOTYPE analysis has excellent reproducibility, but multiple pucks prepared from the same bag of reject can have more variability. This will depend on the grain size of the primary sample – coarse-grained samples will show more variability than fine grained samples.

Since most EXPLOMIN™ LITHOTYPE projects have specific objectives in situations where compromises are required, it is best to discuss your project with the SGS technical team.

DATA HANDLING AND PRESENTATION

- Collated data from EXPLOMIN™ LITHOTYPING projects can be treated
- Arithmetically to create ratios and indices,
- Using multivariate statistics to define clusters and/or domains,
- Mathematically to find functions and relationships,
- Using conditional simulations to assign probabilities to relationships, domains and other data.
- It can be plotted in two or three dimensions using industry-standard software packages that provide graphics, 2-D or 3-D data presentations.



In the above example, 299 EXPLOMIN™ samples were selected from 24 drill holes. This example:

- shows the distribution of copper determined by geochemical analysis in the holes.
- shows the distribution of only chalcopyrite, excluding covellite and chalcocite.

This has significant ramifications for metal recovery for the deposit as chalcopyrite can be floated but not leached and covellite and chalcocite can be leached but not floated.