



# **Best Practice and Compliance in Mineral Exploration – Update**

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America (GSA) meeting in 2016**

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# Best Practice

- This presentation is an update of the original presentation made in 2016.
- There have been many development in our industry since and this update was prepared to reflect many of them.
- The goal of this update is to discuss concepts of Best Practice and conformity with rules such as NI 43-101 and S-K 1300.

Questions are welcome.

# Best Practice – What is it?

- According to “Investopedia” it is:

**“A set of guidelines, ethics or ideas that represent the most efficient or prudent course of action. Best practices are often set forth by an authority, such as a governing body or management, depending on the circumstance.”**

**“While best practices generally dictate the recommended course of action, some situations require that such practices be followed”.**

**Nothing herein is prescriptive and there is room for addition and modifications based on your conditions.**

# Best Practice

## Important aspects of the definition

- First and foremost, they are guidelines. There are two subsets:
  - External – established by regulatory authorities;
    - May or may not have specific mandates. (Regulations permit public companies to establish their own)  
**Example - Audits of data used in mineral resource estimation (not required but very common these days)**
  - Internal - Those established by the companies  
**Example – No safety incidents (especially fatalities)**

# Best Practice – Exploration Pipeline

- The exploration pipeline (target generation through operation of a new mine).



- Simply stated, the goal is discovery and definition of mineral resources leading to development of a new mine.

Establishing and communicating your specific goals can enhance the process towards success.

# Best Practice

## Discovery and Definition (D&D) – Two paths to achieve success.



- Doing the correct things refers to “**What work is needed to make a discovery**”.
- Doing things correctly refers to “**What and how the work will be conducted**”.

The two concepts are synergistic but the **second** is part of “**Best Practice**”.

# Best Practice

## D&D – Improved with Best Practice

- Doing the correct things is subjective. Your results will be the judge.
- **Doing things correctly** (Best Practice) is objective. The purpose is to provide confidence in your processes and results. For whom? Your company leaders and investors.

Doing the  
Correct Things



**Doing Things  
Correctly**

Balanced!

# Best Practice

## D&D – First Step

Build your Fundamental Goals :

- Ideas ...
  - ✓ Safety and Environment (no incidents);
  - ✓ Respect for local processes and local people directly affected
  - ✓ Adherence to all company and regulatory standards



# Best Practice

## D&D – More

- ✓ Communicate your discovery parameters:  
Deposit commodities, deposit size, timing and how they fit with the corporate strategy and Life of Mine Plans;
- ✓ Geologically-valid mineral resources (ensure that your models adhere to known geologic controls);
- ✓ Attention to costs;
- ✓ Others.

# Best Practice

## D&D – Second, understand the various parts of the exploration process



There are distinct stages of exploration:

1. **Target Generation;**
2. **Initial Evaluation;**
3. **Definition of mineral resources;**
4. **Technical, Social and Economic evaluation (to define mineral reserves).**

Success! (with feasibility studies, mineral reserves and new mines).

# Best Practice

## Best Practice suggests:

- ✓ **Define Prospectivity Across All Scales;**  
Use analogies to help define the reason to explore;
- ✓ **Use of multiple types of data;**  
Confirm clear data title – know the data source.
- ✓ **Utilize multi-discipline data evaluation;**
- ✓ **Define Pemissability of the Area.**

# Best Practice

Another way to imagine this

## Phase one - Target Generation

There are two principal parts to understand

1. Prospectivity – geologic risks
2. Permissibility – Country/regional risks  
Understand these well, especially communities, before you start to work

	CRITERIA	Sub-Criteria
Geologic Risks	Prospectivity	<u><b>Geologic Potential</b></u> Maturity Ground Availability Degree of Difficulty
Country Risks	Operational	<u><b>Security of Tenure</b></u> Repatriation of Profits Taxes/Royalties/FCI Infrastructure
	Environmental	<u><b>Legislation</b></u> Communities Issues External Pressure Compliance Cost
	Political	<u><b>Gov't Stability</b></u> Security/Safety Corruption Bureaucracy

# Best Practice

## Phase 2 – Initial Evaluation

For each area selected, the team works to validate the geologic assumptions. Analogies can be useful to communicate the potential for success.

As the program progresses, the amount of data generated and costs increase in support of a decision to stay or go. Decide what is needed to move forward. Best Practice suggests:

- ✓ **Build a sustainable and secure database** – There are various systems available but more and more our industry is moving towards relational databases. – not simply Excel!  
Protocols are necessary to ensure the integrity of your data..
- ✓ **Guarantee security of land tenure)** – Validate land title, accurate topography, GPS, site surveys.

# Best Practice

## More

- ✓ **Use appropriate exploration methods**

For example – portable XRF's can be useful to prioritize work in certain areas but geochemical and fire assay methods are needed to ensure data that may be used in estimation of mineral resources.

- ✓ **Use certified & independent laboratories**

There is no requirement for this yet, but the industry and its investors consider this essential.

Some companies employ in-house labs – generally for definition or grade control drilling.

## And ....

- ✓ **Construct your QAQC protocols** (distribute them to all members of your team and insist on adherence).

# Best Practice

## More

**Why use QAQC? Because all laboratorie make mistakes!**

- Your protocols are needed to check the total range of potential variances.

**Total Sampling Variance = (Site Variance<sup>1.</sup> + Sample Variance<sup>2.</sup> + Preparation Variance<sup>3.</sup> + Analytical Variance<sup>4.</sup>)**

- Duplicates<sup>1</sup> & <sup>2</sup>, Standards and blanks<sup>3</sup> should be included.
- Some companied use a primary AND periodically a secondary laboratory (to check the primary<sup>4</sup>).

**The main goal is to detect batch errors. It is not possible nor cost effective to detect all errors.**

# Best Practice

## More

- The amount of QAQC depends on you - regulations do not dictate it - and there is a **wide** range within industry disclosures but ...
- Consider (every 20 or 25 primary, exploration samples) ...
  - 1 duplicate** (core or RC split to check sample and preparation variances).
  - 1 blank** (some companies make their own blanks)
  - 1 to 3 commercial standards** (certified reference materials “CRM”) similar to the mineralization in your deposit.
    - 1 low-grade, 1 medium-grade, 1 high-grade.
  - Goal - about 15% of QAQC samples.**

**Build your own QAQC protocols in consideration of the characteristics of your deposit!**

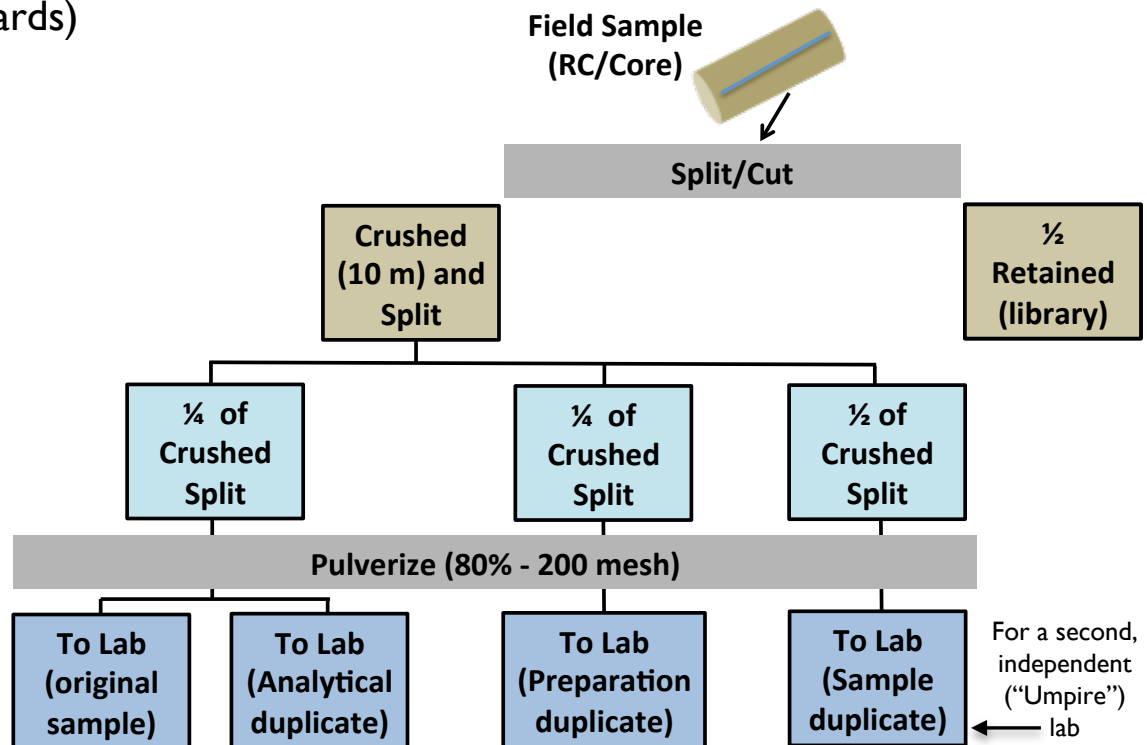


# Best Practice

## More

A typical sample flow

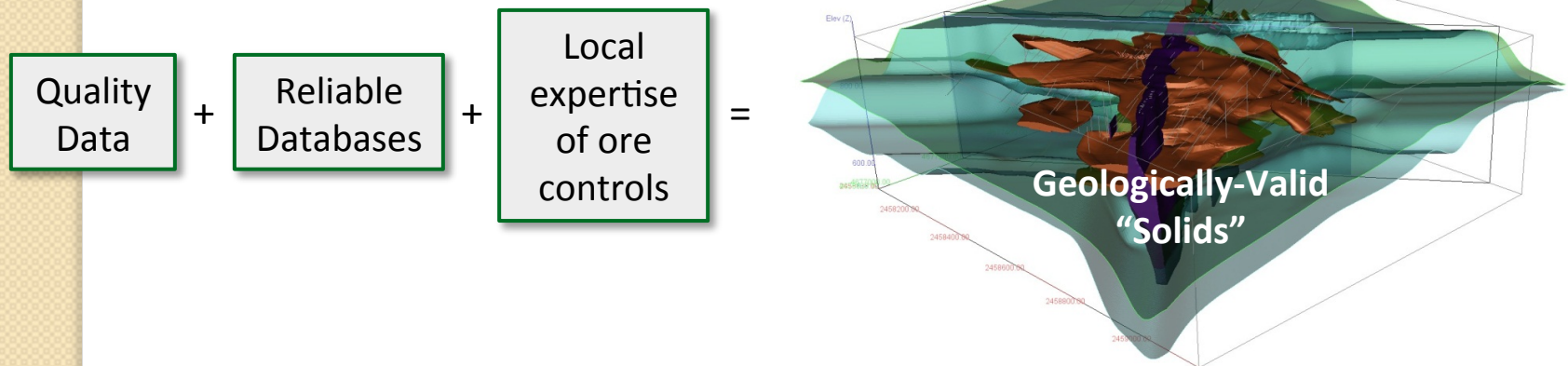
(does not include standards)



# Best Practice

## Phase Three - Definition (and estimation of Mineral Resources)

- The process depends on the type of the mineralization.
- The goal is to produce estimation of mineral resources that reflects the geologic controls.



# Best Practice

## Phase Four - Technical, Social and Economic Topics

Early in the program!

- Metallurgical test and mineral characteristics (for example, NAG (**N**et **A**cid **G**eneration) and PAG (**P**otentially **A**cid-**G**enerating) tests on mineralized and waste rock).
- Select an Environmental Consultant/Contractor to coordinate baseline environmental surveys.
  - Including endangered species research, cultural resource examination.
- Build and operate community awareness programs.
- Others based on your deposit/area

# Summary

**Best Practice** guidelines exist to encourage public companies to take efficient and prudent actions

**Best Practice** covers *doing things correctly* and goes hand-in-hand with doing the correct things, and can enhance the value of the discovery process

**Over-Arching (Fundamental Goals)** build Company and investor confidence in your program objectives and results

**Nothing herein is prescriptive.**

**Build your own protocols and monitor them.**