

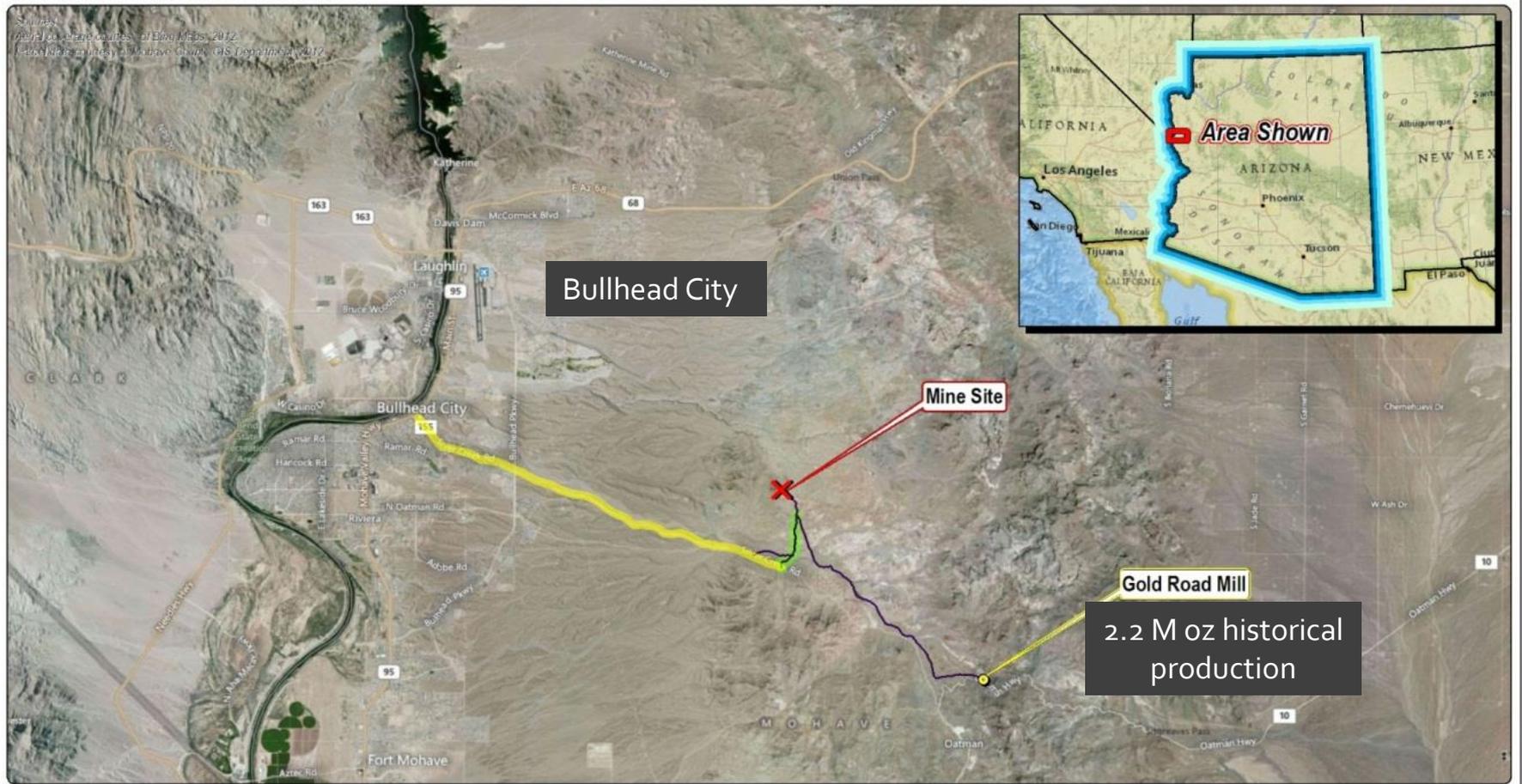
**Epithermal Au/Ag  
Mineralization and Occurrence  
at the Moss Mine Project,  
Oatman Mining District, Arizona**

May 7, 2013

# CONTENTS

- Location
- History
- Regional Geology
- Epithermal Au/Ag Mineralization
- Exploration
- Current status

Sources:  
Aerial imagery courtesy of Esri Maps, 2012.  
Geocoding in Mohave County, GIS Department, 2012.



Bullhead City

Mine Site

Gold Road Mill

2.2 M oz historical production

# Moss Mine Road Improvement Alignment 7717

Mohave County, Arizona

	Preferred Road Improvement Route		Gold Road Mill
	Potential Access Route		Silver Creek Road



# MOSS PROJECT LOOKING NORTH



Captain John  
Moss and  
Paiute Chief  
Tercherrum,  
circa 1860's



# MOSS PROJECT HISTORY

- Capt. John Moss, gold miner/pro prospector, was stationed at Fort Mojave with the “California Volunteers” during the Civil War.
- Capt. Moss was a “peace-maker” and had very good relations with several tribes in the area.
- Chief Iretaba (Yara Tav) is referred to in the literature as a Mojave chief and diplomat. He took Moss to what is now the Moss Project and it is recorded that Moss and his troopers were able to recover 12,000 ounces of gold from a very small excavation.
- Chief Iretaba later went to Washington with Moss to meet with President Lincoln.

# MOSS PROPERTY 1865-1900

- Very little mining activity occurred at the Moss from 1865 to 1900 but with the discovery of the Gold Road Mine, a boom started in the Oatman area.
- Shaft sinking, adits, and pits were the main exploration tools and the Moss saw intense exploration and development.
- Moss vein mineralization differs significantly from volcanic-hosted high-grade bonanza at Oatman (Gold Road, Tom Reed, and United Eastern). These 3 mines produced more than 2 million ounces of gold.

# MOSS PROPERTY – ALLEN SHAFT



# REGIONAL GEOLOGY

Black Mountains, eroded volcanic center of lower Miocene age (+23 to 18 Ma).

Thick sequence of andesite, latitic dacite and rhyolite volcanic rocks intruded by granodiorite to granite plutons.

Geochemistry of volcanics alkalic to subalkalic, shoshonitic (highly potassic) calc-alkaline.

Granodiorite stock (Moss Porphyry) hosting mineralization estimated 10.7 Ma.

Mineralization controlled by faults and fracture sets associated with the mid-Tertiary volcanic activity.

# RUTH MILL CIRCA 1921



# EARLY MINING EXCAVATIONS



# MOSS MINE – ONE OF MANY OPEN SHAFTS



# EPITHERMAL GOLD MINERALIZATION

- Low sulfidation (adularia-sericite) epithermal breccia vein.
- “Moss Vein” forms prominent ridge trending about  $110^\circ$ , dip of  $70^\circ$  S.
- Not a simple fissure vein.
- White quartz and calcite through quartz-calcite with small clasts of wallrock, to brecciated wallrock veined and cemented by quartz-calcite.

# BRECCIA VEIN



**ARI67c 49-54'** breccia vein - clasts of fine porphyry floating in white quartz-calcite matrix

## Preliminary Paragenesis - Moss Mine

chlorite-clay (calcite-quartz-pyrite)

magnetite veins & replacements

gray quartz (+/- pyrite) veins & replacements

rare late pyritic veinlets

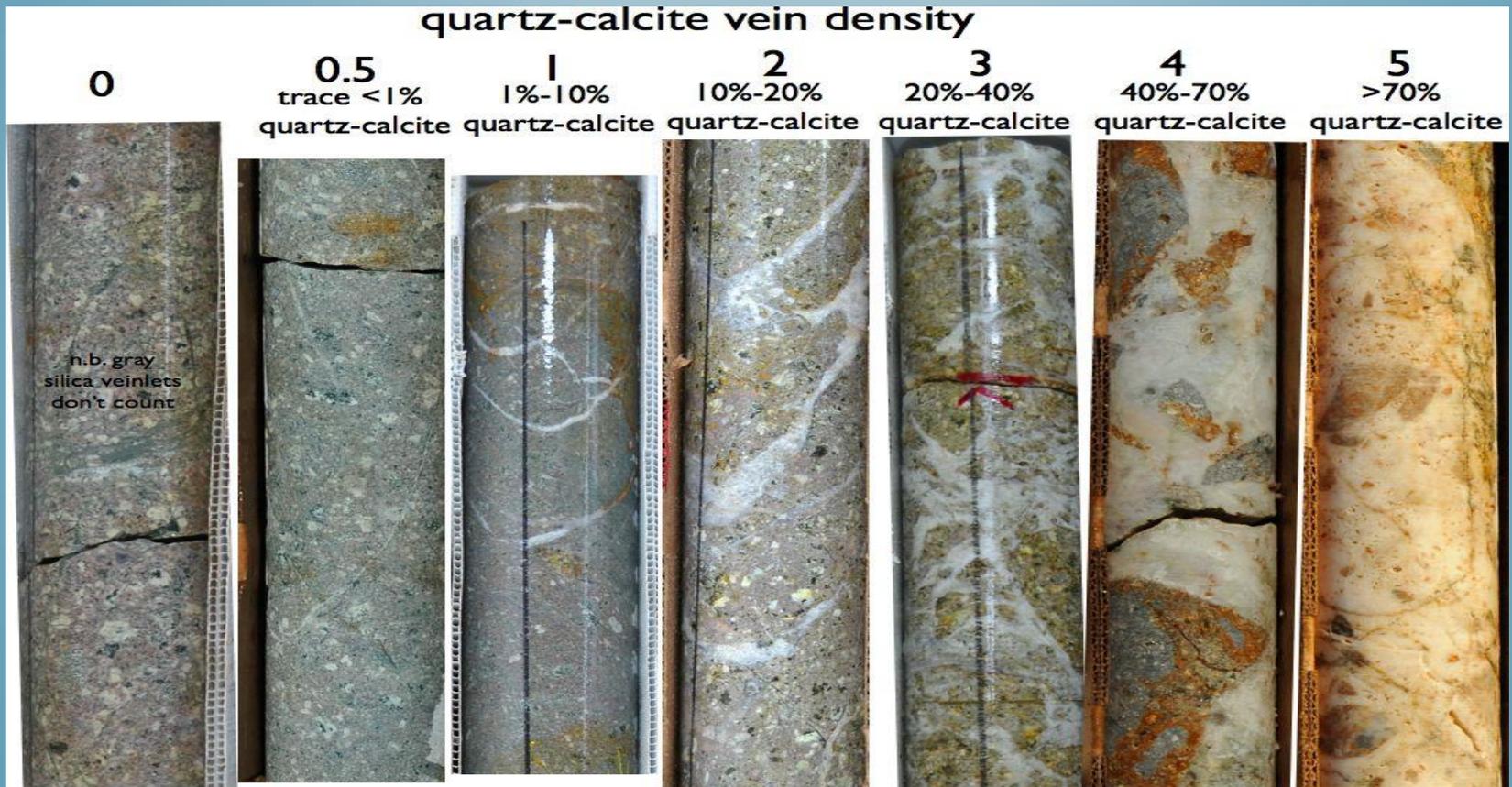
white quartz-calcite (episodic)

Au-Ag-pyrite-silver sulfides

fluorite

limonite/hematite (oxidation)

# VEINING DENSITY



**MOSS VEIN  
SHOWING  
RARE SILVER  
SULFIDE  
ACANTHITE**



**COLLOFORM  
BANDING  
TEXTURE**



**GINGURO  
TEXTURE**

**DARK BANDS  
ARE  
ARGENTITE**



**BLADED  
CALCITE  
TEXTURE**



# UNDERGROUND -65 LEVEL



# PHASE I DEVELOPMENT

## ACTIONS

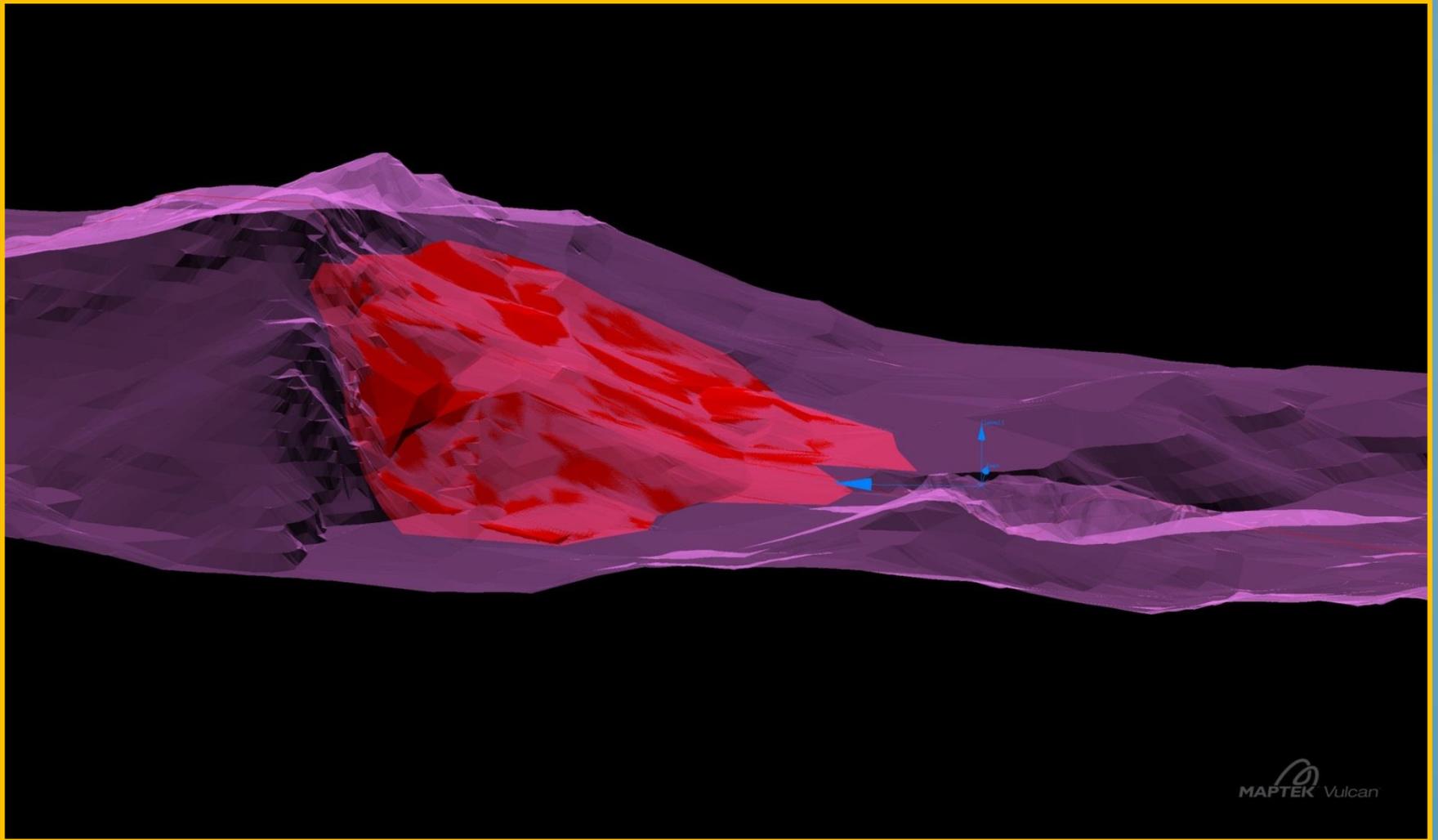
- Mine 90,000 tonnes of higher grade ore from Hill #1
- Stock pile low grade ore
- Use waste rock for facilities construction and disposal
- Heap leach to recover gold and silver

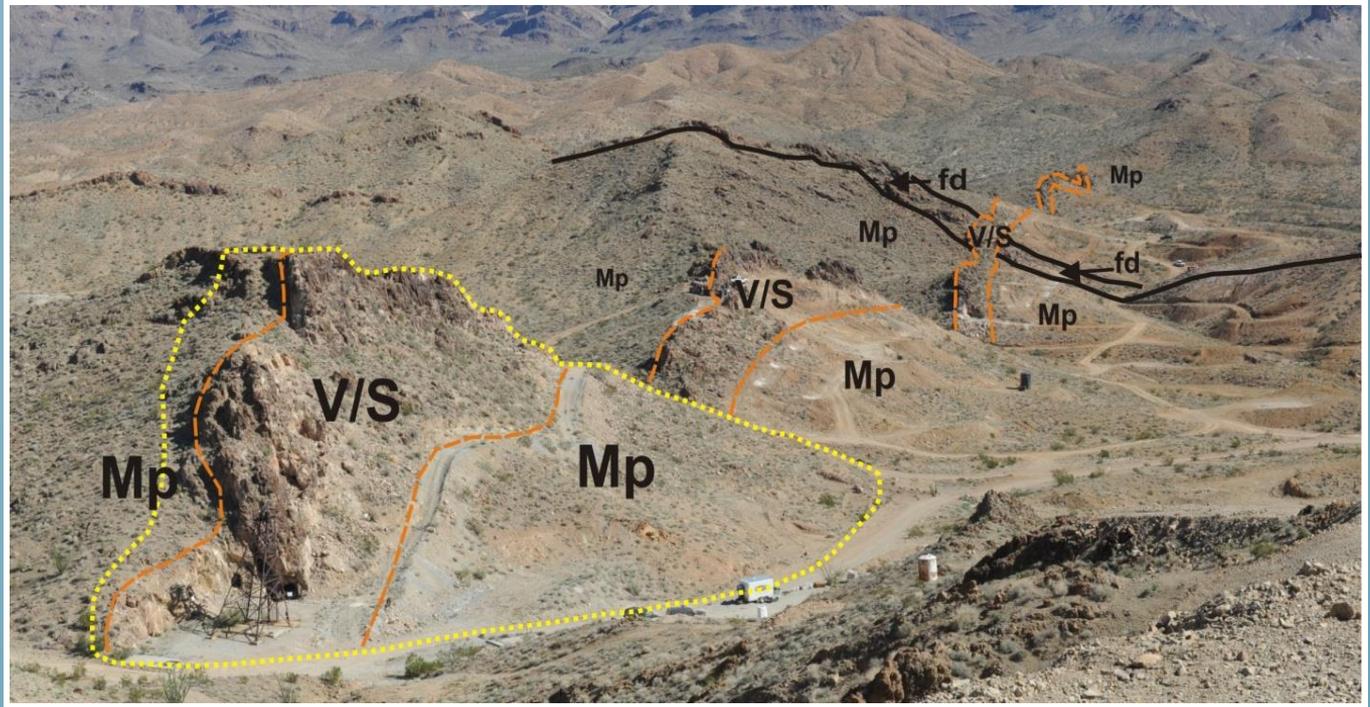
# PHASE I DEVELOPMENT

## OBJECTIVES

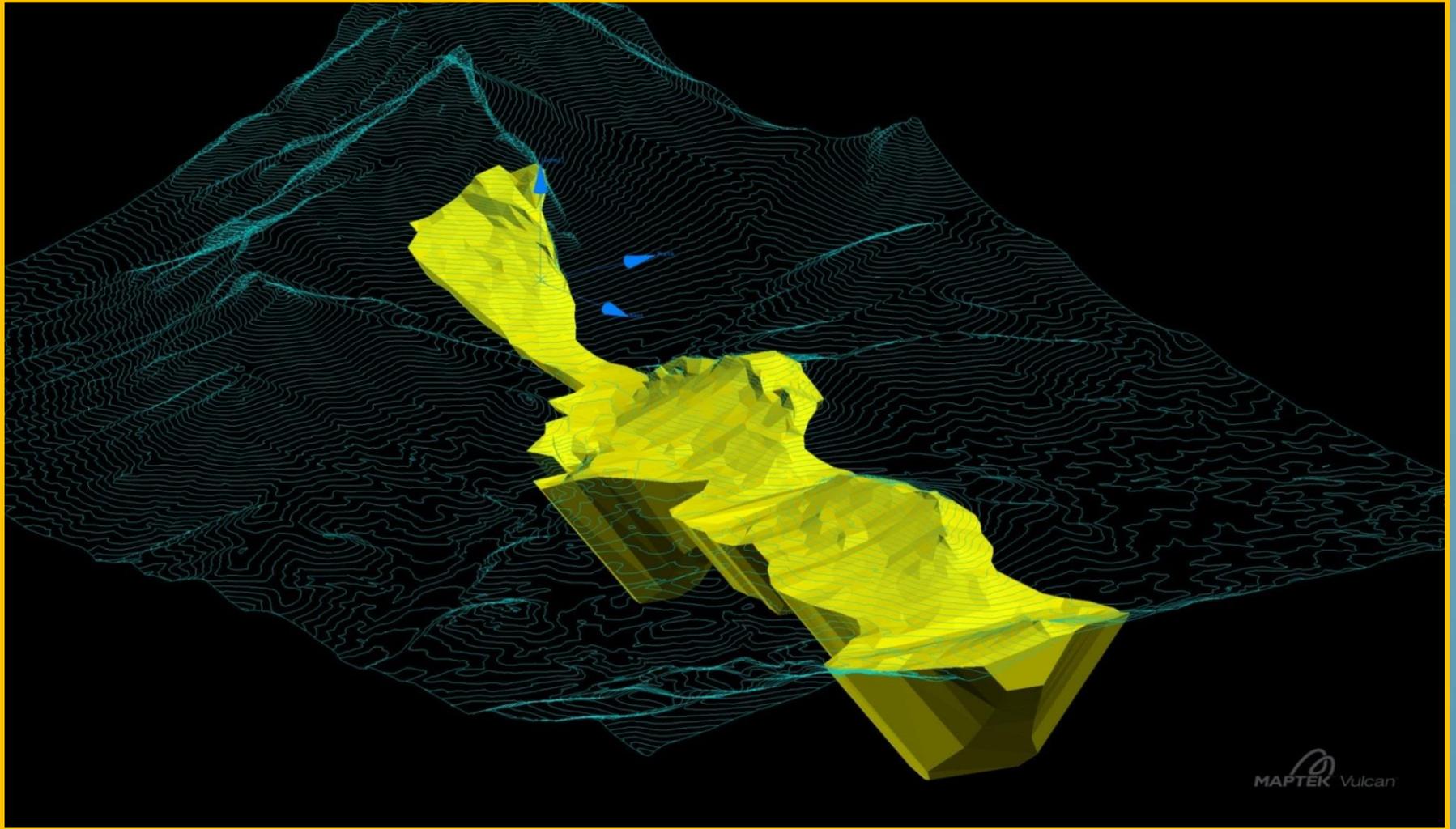
- Prove continuity and grade of ore
- Develop agglomeration techniques and procedures
- Determine heap leach solution kinetics
- Determine pilot scale recovery percentages for gold and silver
- Determine economics of the project
- Provide a basis to raise the capital to construct a mine – or not, as the case may be

# PHASE I DAY-LIGHT QUARRY





# PHASE II CONCEPTUAL PIT



**THANKS FOR  
LISTENING!  
QUESTIONS...  
COMMENTS?**

