

## Lode Mining Activity

The largest lode production from mines in the immediate True North area came from the Soo property, also known as the Spaulding, patented in June 1913. From 1912 to 1914, this mine produced \$75,000 - \$100,000 with the gold price at \$20.67 per ounce. Other lode mines and prospects in the True North area are the Newsboy, Sunrise, Robinson, Hidden Treasure, and Dome View. The Dome View was staked in 1917, on the north flank of Pedro Dome at the 2,000-foot elevation by the Wackwitz Brothers. The adit was 145-feet long and attained a depth of 100-feet. The vein was 12 to 40-inches wide, averaging 30-inches. The Newsboy mine is two miles north-northeast of Pedro Dome. The veins on this property were extensively stoped. The original shaft was 350-feet deep (Hill, 1933).

Poz and Contardi worked the Hindenburg mine, located in the heart of the True North Project, producing stibnite during the summer of 1916. A 25-foot shaft accessed their drifts. During WWI approximately 200 tons of high-grade stibnite ore were shipped.

John Rogash located the Ohio claims in the East pit area in 1916 and three shallow shafts were dug on a quartz-stibnite vein striking east west (Hill, 1933).

In 1942, Mike Myntti drove a 140-foot crosscut and installed a stamp mill at the Hindenburg Mine, centrally located within the Hindenburg pit. The mineralized zones are variably described as nearly flat lying or dipping 60 degrees SE (Haskins, 1981). During this same year Myntti worked on the Markovich property, near the south end of the proposed Hindenburg pit, shipping 16-tons of ore containing 38% antimony, which was taken from small pods and stringers (Joesting, 1942).

The Chomco claims covering the northern portion of the True North Project were purchased and worked in the late 1960's and early 1970's by Frank Mate and Richard Raines who discovered five mineralized zones using geochemical prospecting. Various lessees have continued excavation of the Hindenburg area and have explored the Ohio prospect and the south trench area.

In 1990, Amax Gold Incorporated (AGI) negotiated a mining lease on the Chomco claims. A 4-hole, 1,000-foot, drilling program was completed in 1991. These results prompted expansion of the property position by acquiring the Shepard claims in the winter of 1991 and by staking the open ground in Spruce Creek in the fall of 1991. An expanded exploration program in 1992 included soil sampling, a geophysical survey, trenching, and a 16-hole, 5,332-foot drilling program.

In 1993, AGI sold their interest in the True North property to La Teko Resources, Inc. Between 1993 and 1994, La Teko drilled 57,302-feet of exploration holes. In 1995, Newmont Exploration Limited (NEL) and La Teko formed a joint venture (65%: 35% respectively) to explore the property. Between 1995 and 1998, NEL completed a multi-faceted exploration program that included extensive soil sampling, wetland delineation and cultural resource surveys, geophysical surveys, trenching, drilling, metallurgical testing, geological interpretation, computer modeling, and reserve definition.

In 1999, Kinross acquired La Teko and purchased Newmont's 65% interest in True North. A 14,000-foot drilling program was completed to further define reserves in the

Hindenburg area and to define area hydrology, material characterization for acid rock drainage (ARD) potential, geotechnical survey, permafrost evaluation, and the mineralized area to be encompassed by the prospective Millsite Lease area for the True North Project.

## **1.4 Geology**

### **1.4.1 Regional Geology**

The True North deposit is located within the Yukon-Tanana terrane, which is bounded on the northeast by the Tintina fault and on the southwest by the Denali fault. The Yukon-Tanana terrane consists of accreted metamorphic rock of primarily sedimentary origin that were subjected to greenschist, amphibolite, and eclogite-facies grade metamorphism. Intermediate to felsic plutons and stocks intruded the metamorphic rocks during the Cretaceous Period (85 – 95 million years ago).

The Yukon-Tanana metamorphic rocks, within the Fairbanks mining district, are primarily composed of the Chatanika terrane and the Fairbanks Schist. The Chatanika terrane is postulated to have been thrust over the Fairbanks Schist prior to retrograde metamorphism of both units to greenschist facies and the Cretaceous intrusive activity. High angle northeast striking faults transect the district and offset all rock types.

### **1.4.2 True North Deposit**

The True North property is bisected by the high angle northeast striking Eldorado Fault that emplaced the Fairbanks Schist, in a high angle contact with the allochthonous Chatanika terrane. The True North deposit occurs in a structurally complex mineralized zone within the Chatanika terrane, parallel to the Eldorado Fault. Ore zones are typically gently dipping, variably brecciated zones that may be related to regional thrust faulting. The thickness and shape of the breccia zones are widely variable and appear to have been modified by higher angle faults.

Calcareous and carbonate-altered schist of the Chatanika terrane hosts the True North deposit. These rocks have been subdivided into three main lithologic subunits: (1) a slate unit consisting of slate and fine-grained carbonaceous quartzite; (2) a mafic schist unit consisting of chlorite-biotite-amphibole schist, eclogite, amphibolite, and marble; and (3) a felsic unit consisting of muscovite schist, quartz-muscovite-biotite schist, and quartzite. The felsic and mafic schist units are the main hosts for gold at True North.

Fine-grained gold is closely associated with pyrite, arsenopyrite, and (less directly) stibnite in the unoxidized portion of the True North deposit. Gold occurs in drusy quartz veins and altered and brecciated schist adjacent to the quartz veins. The most intensely mineralized zones are graphitic breccias with numerous quartz-carbonate-sulfide veins. Less intensely mineralized zones contain fewer quartz veins in variably brecciated, iron carbonate and calcium carbonate altered schist. Weakly mineralized to unmineralized zones are calcite-altered and are locally brecciated.

A third-party review by SRK of both ore and development rock characterization found that the True North Project rock has very low potential for acid generation, but the rock

is naturally oxidized and some of the oxidation products are potentially soluble. Additional geochemical characterization of the ore and development rock are ongoing and will continue throughout the mine life.

## **2.0 FEASIBILITY STUDIES**

### **2.1 Baseline Analysis**

#### **2.1.1 Environmental Analysis**

FGMI has augmented previous baseline studies with additional evaluations to further identify the existing site conditions and potential impacts associated with development of the project. The compilation of all environmental baseline work performed at the True North Project consists of five main components:

1. Surface and Ground Water Hydrologic Studies
2. Wetland delineation (3)
3. Cultural resource survey (2)
4. Flora and Fauna Surveys (Threatened and Endangered Species)
5. Socioeconomic Evaluation
  - A) Visual impacts
  - B) Land uses/values
  - C) Noise impacts
  - D) Traffic impacts

Some earlier surface hydrologic data with limited static levels from exploration drill hole logs were available. However, the information was preliminary and incomplete to identify the hydrology of the area. FGMI, in order to understand the overall hydrologic regime, began surface water sampling and groundwater delineation in September of 1999. The evaluation included the review of weather/climatic data available for the region and the True North Project area. The water baseline program for both surface water and groundwater hydrology has been augmented and includes installation of five-(5) thermistors to evaluate permafrost impacts on groundwater hydrology. Nine (9) groundwater-monitoring wells were installed in December 1999 and sampling began in January 2000. Results from the hydrologic studies indicate that the Hindenburg and East pits are dry. Mining operations will not intersect the ground water table. Mine plans will be adjusted to insure that the maximum pit depth does not intersect the water table and an adequate buffer of insitu material remains above the water table to avoid adverse impacts to both surface and ground water quality. Monitoring and sampling will continue through development, operations, reclamation, and closure (True North Project Monitoring Plan).

ABR, Inc. performed three wetland delineations for True North. No high value wetlands are located within the Millsite Lease area. The impacted wetlands are associated with permafrost and have vegetative cover of black spruce and a moss mat. Similar type wetlands are abundant in the True North Project area and surrounding region (ABR, Inc., 1996, 1997). Approximately 64 acres of wetlands will be disturbed due to roads and pit development. The office, shop, explosive storage area, development rock dumps, growth medium stockpile and ore stockpile will all be located on uplands.

Northern Land Research, Inc. performed three cultural resource surveys covering the exploration area (including the Millsite Lease area) and the access/haul road from the Steese Highway. From these studies, it was determined that a total of 38 known historic properties are located within the current True North Project claim boundary. Of these 38 historic properties, only five are expected to require additional levels of documentation (four from the Spruce Creek area and one from the Dome Creek area). All five sites, including the Davidson Ditch are outside of the proposed Hindenburg/East pits, ancillary facilities development (i.e. growth medium/development rock dumps, shop, and explosive storage) and access road from True North to the Fort Knox Mill.

ABR, Inc performed reconnaissance-level evaluations of threatened and endangered species on five separate occasions (September 1995, May-June 1996, May-June 1997, May-June 1998, and May 2000) in the True North Project area. The conclusion of the evaluations are, the True North Project area does not currently support any threatened or endangered species, but does support populations of three species of concern: Northern Goshawk, Olive-sided Flycatcher, and lynx. Populations of these species appear to be present in numbers similar to other locations in interior Alaska. Suitable habitats for these species are abundant in the True North area and surrounding region.

The socioeconomic baseline report identified population and demographic, local and regional economies, regional and community facilities and services, project area land use (including mining and recreational uses), transportation, visual resources (including view shed and lights), and noise and vibration. The evaluations were conducted as near as one mile and as far as  $\pm$  8 miles (Mining Public Consent, LCC).

The complete noise and vibration analysis covered both winter and summer baseline field studies and evaluated the affects from traffic associated with the True North Project and the access/haul road.

Information collected from the baseline studies assisted in the development of the mine operations plan and access/haul road alignment.

## **2.2 PROCESSING, ORE TRANSFER, AND ACCESS/HAUL ROAD**

### **2.2.1 Processing**

The Fort Knox Mine has a conventional milling facility within 12.5-miles of the True North Project ore deposit. The use of this existing facility will require no processing component on the True North Project mine site. FGMI has requested modification of the Alaska Department of Environmental Conservation (ADEC) Solid Waste Disposal Permit for the Fort Knox Mine (#0031BA008) to allow compatible ore from satellite pits to be trucked to the Fort Knox mill for processing. The revised Solid Waste Disposal Permit would require FGMI to conduct specific satellite ore characterization tests and demonstrate that there will be no significant impact on mine closure, reclamation or water quality at Fort Knox to FGMI being authorized to process offsite ore from specific ore bodies. Ore will be trucked to the Fort Knox Mill for processing. The ore will be treated and tailings material deposited within an existing zero discharge facility. No additional disturbance will be necessary on the True North Project site to accommodate a mill and ancillary facilities. No additional disturbance will be required in the surrounding drainages for creation of a dam and tailing storage, thus minimizing the potential adverse impact to surface and groundwater.

### **2.2.2 Ore Transfer**

Trucking ore from True North to the Fort Knox mill involves no special equipment or out of the ordinary accommodations.

The use of 60-ton over the Highway Trucks will allow FGMI to achieve the increased payloads from conventional (30-ton) over the highway type trucks to supply the mill with 10,000 tons per day of ore. This allows for minimizing the volume of truck traffic on a daily basis. Because these are conventional type trucks the safety concerns for other road traffic are minimized. The 60-ton trucks are designed and built to minimize impacts due to noise.

### **2.2.3 Access/Haul Road**

The main access/haul road will be constructed from the southeast corner of the True North Millsite Lease boundary along the north side of Pedro Dome (Figure 2-1) At a 6% grade and will use approximately 2,500 feet of the existing Pedro Dome road/True North road. The road then leaves the existing Pedro Dome/True North road on the west side of the ridgeline immediately southwest of the Cleary Summit Subdivision on the Pedro Dome side of the Steese Highway to create a new intersection approximately 2,400-feet southwest of the existing intersection on a straight section of the highway. The new alignment (Driveway Permit issued by Alaska Department of Transportation & Public Facilities) passes under the Steese at a 90-degree angle then contours the hillside to a point from whence it climbs at a four percent grade to the west side of the topographic feature then flat to its intersection with Fish Creek Road. The route crosses under the Steese Highway farther to the west than the existing intersection and circumnavigates a large topographic feature on the east side of the Steese Highway before tying into Fish Creek Road approximately 2,500-feet south of the nearest residence. The State of Alaska Department of Natural Resources

and the Mental Health Trust control the land status. The road location minimizes visual impacts both during the day and at night (lights), lessens the grade down slope of the neighboring residences, and therefore should lessen the noise they would experience due to loaded trucks coming up the grade. It also moves the alignment further down slope of the residences and out around a major topographic feature that will serve to minimize the traffic noise. The True North Transportation Plan addresses operating conditions, safety, signage, snow removal, spill response, road maintenance, lights, noise, and viable alternatives to minimize dust from traffic including; water, chemical treatment (calcium chloride, etc.), chip seal, or asphalt.



## 3.0 TRUE NORTH MINE COMPONENTS

### 3.1 General

This section describes the components of the True North Project including the open pit mine, development rock dumps, ore stockpile, growth medium stockpile, ore haulage, shop/office, power supply, water supply, and general infrastructure including haul/access, mine, and exploration roads (Figure 3-1 & 3-2).

### 3.2 Basic Design Information

The basic design parameters for the True North Hindenburg and East Pits are summarized as follows:

#### MINE LIFE

- Current projection 2.5 to 3 years;

#### WORK FORCE

- 100 to 110 employees;
- No living accommodations on site;
- No cafeteria;

#### OPERATING PERIOD

- Pit operations 24 hours per day;
- Mining 365 days per year;

#### ORE PRODUCTION RATE

- Approximately 3.5 million tons of ore per year at a rate of approximately 10,000 tons of ore per day hauled to the Fort Knox Mill for processing (mining rates vary seasonally);

#### PIT

	<u>Hindenburg</u>	<u>East Pit</u>
• Pit Ore Tons:	6.8 million	0.4 million
• Pit Waste Tons:	14.0 million	1.5 million
• Pit Dimension (N-S):	2,000-ft	500-ft
• Pit Dimension (E-W):	2,200-ft	1,000-ft
• Crest Elevation:	1,650-ft	1,530-ft
• Bottom Elevation:	1,150-ft	1,200-ft
• Bench Height:	10 to 20-ft	10 to 20-ft
• Pit Slopes:	35° to 50°	30° to 45°
• Mine Haul Road Width:	80-ft	80-ft
• Mine Haul Road Grade:	8%	8%

#### DEVELOPMENT ROCK

- Approximately 20,000 tons per day;
- Strip ratio 2:1;

#### ORE STOCKPILE

- Located near the maintenance complex;

#### GROWTH MEDIUM STOCKPILE

- All material suitable for establishing a viable vegetative cover consistent with the designated post-mining land use;

#### ORE HAULAGE

- 24 hours per day (weather dependent);
- 365 days per year;
- An average 3.5 million tons per year at a rate of approximately 10,000 tons per day hauled to the Fort Knox Mine site (mining rates vary seasonally);
- Conventional tractor-trailer, 60-tons per load;
- 100 to 170 truck loads to the mill per day;

#### EQUIPMENT

- Loaders (2) 13-yard;
- Haul trucks (3) 100-ton;
- Ore trucks (9) tractor-trailer;
- Blast hole drill (1) 45,000-lb pull-down class;
- Support equipment: track dozers, a rubber-tired dozer, motor graders, water trucks, a backhoe, small trailer-mounted light plants;

#### ELECTRICAL REQUIREMENTS

- Grid power right-of-way ADL 416477 (approximately 3-miles) supplied by Golden Valley Electric Association;
- 480-volt, 3-phase power;

#### WATER SUPPLY

- Water supply well drilled to provide approximately 540 gallons per day (gpd) (Temporary Water Rights LAS 22789)
- Bottled water will be purchased for drinking water;

#### ACCESS/HAUL AND EXPLORATION ROADS

- 100-foot right-of-way (50-feet either side of centerline) mine access/haul road;
- 80-foot mine haul road;
- 30-foot exploration access road.

### **3.3 General Site Plan**

Figure 3-1 and Figure 3-2 show the general arrangement of the True North Project. The open pit mine is located on the northwestern flank of Pedro Dome. The shop maintenance complex is southeast of the pit along the access/haul road. Administrative functions will be coordinated from the Fort Knox Mine site.

The existing road access to the True North Project is from the Steese Highway to Cleary Summit, then 6.5 miles via the gravel road around the south side of Pedro Dome, the main access/haul road is shown in Figure 2-1.

### **3.4 Mining**

#### **3.4.1 Mining Method and Equipment**

Production rates for the conventional open pit mine will average 10,000 tons per day of ore and 20,000 tons per day of development rock. Standard drilling and blasting techniques will be used to break the ore. Ore will be drilled using blast hole drills. Blasting will occur once a day, five days a week. Once blasted, the ore will then be loaded using a 13-cubic yard front-end loader.

Ore will be transported from the pit by conventional highway tractor trucks pulling 60 - ton trailers with an overall length of approximately 53-feet long. The ore will be transported by a contract trucking company to the Fort Knox Mill for processing. During inclement weather or at other times when it is not possible to truck to Fort Knox, ore will be stockpiled at the True North Project by 100-ton off-road haul trucks.

Auxiliary mine equipment will include an ammonium nitrate and fuel oil (ANFO) truck, track dozers, a rubber-tired dozer, motor graders, lube and service trucks, water trucks, a backhoe, and small trailer-mounted light plants.

#### **3.4.2 Open Pit, Development Rock Dumps, and Ore Stockpile**

Depending on material type, bench heights will vary between 10 and 20-feet, based on production, grade control, and geotechnical considerations. Overall pit wall slopes will vary from 30 to 50 degrees, depending on rock competency (Figure 3-2).

Mine haul roads are generally 80-feet wide with a maximum grade of 8%; this provides safety by giving separation for mine personnel and equipment. The primary exit from the pit is on the north and east rims. The exit point of the pit will vary as mining progresses.