

**GEOLOGICAL APPRAISAL ON THE “SAN JOSE DE LAS AGUJAS” MINING PROPERTY AND ORE RESERVE ESTIMATION. Gold-Silver**

**Municipality of Mascota, Jalisco, Mexico**

**July 11th, 2011**

**By Juan J. Vera**

**TECHNICAL EXECUTIVE SUMMARY**

**INTRODUCTION.**

The “San Jose de las Agujas” a gold-silver mining property is located 5 kilometers straight-line NE of the Navidad Village and about 19 kilometers NE by dirt road from Mascota town, State of Jalisco. Access to the site is either from the city of Guadalajara, driving approximately 210 kilometers westward by paved road till Mascota town, or from Puerto Vallarta driving east approximately 90 kilometers by paved road to reach Mascota town. (see: Plate 1).

The property consists of three mining concessions, named “San Jose de las Agujas” 50 hectares; “El Rocio” 164 hectares and the “La Luz” 91 hectares (total 305 hectares). Surrounding area is controlled by Soltoro, S.A. de C.V (100 % Mexican Subsidiary of Soltoro Ltd, a Canadian Company).

**REGIONAL GEOLOGIC SETTING. TRANS-MEXICAN VOLCANIC BELT.**

The San Jose de las Agujas gold-silver property is an epithermal bonanza precious metal vein type deposit. It lies within the Guachinango-Navidad Mining District on the westernmost end of the physiographical province known as the Trans-Mexican Volcanic Belt (TMVB)

The TMVB is a 20 to 150-km-wide and approximately 1000-km-long metallogenic province which extends E-W from Veracruz in the Gulf of Mexico to Puerto Vallarta in the Pacific Coast. The TMVB is characterized by late Tertiary to Quaternary volcanic activity and is underlain by Paleozoic metamorphic rocks and Mesozoic sedimentary and igneous (granitic to granodioritic) intrusive bodies. Oligocene-Miocene rhyolitic and ignimbritic rocks of the Sierra Madre Occidental should also occur beneath the Mio-Pliocene to recent volcanic rocks of the TMVB. Active volcanoes (Popocateptl, Colima) and geothermal fields (La Primavera, Los Azufres, Humeros) reveal magmatic process.

World class precious metal mining districts have been discovered in the TMVB. Pachuca-Real del Monte, is unique for its enormous silver-gold production spread over more than four centuries of almost continuous operation. Silver output is conservatively estimated at some 1.2 billion troy ounces and 6.2 million ounces of gold (A.R. Geyne et al. Consejo de Recursos Minerales); Tlalpujahuá-El Oro; Taxco; Angangueo: Temascaltepec; Zacualpan.

#### **MINING HISTORY. DISTRICT OF MASCOTA, NAVIDAD.**

An excerpt from the book “The Mines of Mexico”, volume IX, page 147, published in October 1905 under the authorization of the Mexican Government by J.R. Southworth, (printed by Blake & Mackenzie, Liverpool, England), states as follows:

*“WESTERN JALISCO.....About a day’s ride to the southwest of Guachinango one enters the important camp of Navidad, in the District of Mascota, from nine to fifteen miles east of Mascota and from sixty to sixty-five miles west from Ameca. It is reached by a very fine trail from Ameca and recently much heavy machinery has been transported over this trail”..... “There are evidences of some ancient mining through the district, but in the light of recent development of large bodies of exceptionally rich and easily treated ores, it causes surprise that such exceptionally thorough prospectors as the Spaniards should have done so little. The veins are of good size and the ores unusually rich. The ores consist principally of silver sulphides carrying good gold values, with some distinctly gold ledges. The method of treatment of these ores has heretofore been by amalgamation in the patio, or by pan process, with subsequent concentration of the tailings and slimes”..... “Near the town of Navidad Messrs. Henry Sunde and Son have opened a new property and discovered very valuable ore bodies. Their high-grade ore is said to have a shipping value of \$ 2,000 per ton. They have not installed reduction works as yet, but development is actively progressing.”*

*“In nearly every instance where Americans have opened mines in this district they have been successful in developing high-grade ore. A great amount of mineral territory has lately denounced, and every indication points to a district of great production”.*

#### **CONSEJO DE RECURSOS MINERALES. (MINERAL RESOURCES COUNCIL. Mexican Government Agency for Mining Development. Today: Fideicomiso de Fomento Minero )**

A geological assessment work was performed by The Consejo de Recursos Minerales ( Servicio Geológico Mexicano) in February 1978 (see: Reconocimiento Geológico Preliminar al Fundo Minero San José de las Agujas, Municipio de Mascota, Estado de Jalisco. Archivo técnico No. 140256, by Hildeberto Sandoval Suarez.) [www.coremisgm.gob.mx](http://www.coremisgm.gob.mx) Clave 1478SASH0001. Municipio Mascota, Jalisco.

It is mentioned that 44.18 metric tonnes of ore mineral was shipped to IMMSA (Industrial Minera Mexico) Smelter at San Luis Potosí, SLP., (february-march, 1975), averaging gold 12.5 g/ton; silver 759 g/ton.

Underground sampling on level 1 and level 2, executed by Ing. Rodolfo Rodriguez Aldaco (1976), returned **silver values** as high as 1000 to 1500 grams/ton and 3000 grams/ton upon a 0.55-meter width on a sulphide band into the vein; **gold values** varies from 15 to 20 grams/ton. (see San José de las Agujas Vein. Longitudinal Section.).

## **LOCAL GEOLOGY. VEIN STRUCTURE. MINERALIZATION AND HYDROTHERMAL ALTERATION.**

The main outcropping rock in the **San Jose de las Agujas area** is a volcanic porphyry rhyolite flow dome and breccia, overlying altered andesitic tuff and flows.

The main vein structure known as San Jose de las Agujas is hosted within altered rhyolite rock. The vein has been observed for about 800 meters length, striking N-S and dipping 80° westward to vertical; vein width varies from 1.00 to 2.50 meters. Fine-grained quartz along with limonite, hematite, pyrite dissemination and remnants (boxworks) of pyrite and banded black silver sulphides are observed on the vein outcrop.

An estimated 150-meter wide and 800-meter long of argillic, pyrite (limonite) and silicified alteration (massive chalcedony) halo is hosted along the vein structure on the porphyry rhyolite.

Three parallel and adjacent quartz-vein structures striking N-S, lies eastward from the San Jose de las Agujas vein; such as, Socorredora vein, San Agustin vein and the El Poblano vein.

## **MINE WORKINGS.**

Evidences from an old map dated on the year of 1921 shows that the San Jose de las Agujas vein has been developed and partially mined-out along a 250-meter strike-length and approximately 120-meter depth. (see: Longitudinal Section. Las Agujas Vein).

Two collapsed shafts located 150-meter away each other have been identified:

1) The **“Londres Shaft”** is collared in the northern site of the vein, its depth is unknown (40-meter deep?).

2) The southern shaft is known as the **“Main Shaft”**, it is approximately 120-meter deep and currently, it is inaccessible down the bottom.

**3) Underground workings have been developed recently, during years 2008-2009, as follows:**

a) **“Level 1950 South”** (Capulín tunnel). It is a 140-meter length tunnel striking south along the vein structure. During a previous visit to the property in August 2001 (J.J. Vera) a 1.50-meter width channel sample was taken on the vein at drift face (75-meter from drift’s portal) gold and silver values returned as high as **21.41 grams gold per ton and 487 grams silver per ton**. (Chemex Lab, S.A. De C.V. Guadalajara, Jalisco. September 6, 2001)

b) **“Ramp 1830 North”**. It is a 210-meter length decline ramp. The Las Agujas Vein exhibits a 1.5 to 3-meter wide quartz, FeOx (hematite), pyrite dissemination, black banded

silver sulphide; very fine native gold flakes are observed after crushing and panning the vein material.

c) **The “La Estructura” shaft.**- This is an underground workings located 100 meters south of the El Capulín tunnel’s portal. The La Estructura workings, is a 45-meter vertical depth that connect the southern end of the drift “Level 1950 south” up to the surface (ventilation shaft).

**SAMPLING.**

200 channel samples were taken on the vein structure (underground), averaging gold 3.8 gr/ton; silver 119 gr/ton. Samples were assayed at the mine site laboratory and some random samples were processed at an external laboratory as umpire assay (Geoquímica de Mexico, S.A. de C.V.), this is, to keep control and high quality standard on the mine site laboratory (see: ore reserve estimation. spread sheet).

**THE SAN JOSE DE LAS AGUJAS VEIN. GEOLOGIC MODEL.**

The San Jose de las Agujas vein is classified as an epithermal bonanza precious metal low-sulfidation deposits (quartz-adularia-sericite) hosted on volcanic terrain (based on Berger and Eimon’s model, 1983); this is after, vein structure, mineralization and hydrothermal alteration pattern have been identified in the area.

Paleosurface has been eroded down to current topographic-geologic level in order to expose the upper part of the gold-silver mineralization system.

**ORE INVENTORY AND MINERAL RESOURCES ESTIMATION. US DOLLAR TON VALUE.**

Currently, ore-mineral reserves (proved + probable), plus mineral resources and economic potential are very attractive on the San Jose de las Agujas Vein.

Ore reserves and feasibility study is supported after development of underground workings; gold-silver assays; metallurgical test on gold-silver recovery; mineralogical assemblage; hydrothermal alteration pattern and vein structure geologic model performed on the mining property.

**LAS AGUJAS VEIN.**

**A) ORE MINERAL RESERVES.**

MINERAL	TONNES	ASSAY		VEIN WIDTH/ meter
		Gold /gr.ton	Silver /gr.ton	
PROVED	21,131	3.8	119	2.00
PROBABLE	14,600	3.8	119	2.00
<b>TOTAL</b>	<b>35,731</b>	<b>3.8</b>	<b>119</b>	<b>2.00</b>

**Estimated ore mineral value should be as, US \$ 252.34** dlls, per tonne. ( this is, after 81.9 % gold metallurgical recovery and 80.7 % silver metallurgical recovery. Quotation: gold price US \$ 1,447.96 troy ounce; silver price US \$ 34.84 troy ounce. COMEX gold/silver, cumulative average quotation, January-June 2011).

**Total ore reserve (proved+probable): 35,731 x US \$ 252.34 = US \$ 9’016,360** dlls.

**B) MINERAL RESOURCES (POTENTIAL): 1.6 million metric tonnes**

**1. The Las Agujas Vein:** It is estimated a total of 600,000 metric tonnes mineral resources; this is considering an “ore horizon” about 800-meter strike-length vein; 250-meter vertical range; 2-m width vein average; 60 % minable reserves; 2.5 gr/cm<sup>3</sup> rock specific gravity.

It means a total potential value circa US\$ 151.4 million dls.

Gold-silver mineral resources on the Las Agujas vein could yield approximately 104,560 minable gold ounces equivalent.

**2. Three mineralized structures:** An additional 1.0 million metric tonnes mineral resources is considered summing up mineralized structures such as the “Socorredora” vein, “San Agustin” vein and the “El Poblano” vein.

**CONCLUSION AND RECOMMENDATION**

The San Jose de las Agujas property is classified as an epithermal bonanza precious metal low-sulfidation deposit hosted on volcanic terrain. Outcropping exhibits the upper part of the mineralized system.

Feasibility study of the mining property warrants a US \$ 4.7 million dollars capital investment in order to put on stream a 200-ton/day mining operation, yielding an output of 6,003 ounces of gold and 185,248 ounces of silver per year / total sale gross value: US \$ 15'146,760 dls /year. This means a total annual revenue on Net Smelter Return (NSR) equivalent to US \$ 13'632,084 dls. Mineral Resources on the San Jose de Las Agujas vein, warrants a minimum of 10-year mine life operation.

Estimated capital investment (US \$ Cy) will be as follows:

Mining Equipment, vehicles and ore haulage trucks	901,813
Process Plant, Power(diesel) and engineering design	2'271,645
Working capital: Mine development and pre-production	533,110
Working capital: Process plant design and launch production	715,614
Working capital: Administration	310,805
<b>TOTAL</b>	<b>4'732,987</b>

Respectfully submitted

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