



**GEOEXPLORERS' AND DR. JAN KRASOŃ'S EXPERIENCE  
IN EVALUATION AND ASSESSMENT OF THE MINE TAILINGS  
AND  
EXPLORATION FOR BASE AND PRECIOUS METALS DEPOSITS**

*(BASED ON JAN KRASOŃ'S NOTES )*

*by*

*Ryszard A. Korol*



## GEOEXPLORERS' AND DR. JAN KRASOŃ'S EXPERIENCE IN EVALUATION AND ASSESSMENT OF THE MINE TAILINGS AND EXPLORATION FOR BASE AND PRECIOUS METALS DEPOSITS

Ryszard A. Korol

### SYNOPSIS

Geoexplorers International, Inc. was founded in 1974 by Dr. Jan Krasoń and has operated worldwide ever since. It is a highly reputable and internationally recognized consulting and exploration company, incorporated in March 1977 in the State of Colorado, USA. Following Jan Krasoń's death in 2015, the company is managed by Ryszard A. Korol - the present President and CEO.

Since 1994, Geoexplorers International, Inc. has refocused its core business on the following:

- Conducting in-house research, evaluating discovery potential, exploration, acquisition, and development of mineral and gas and oil resources.
- Geoexplorers International, Inc. pursues joint ventures with partners for larger exploration projects.
- In the case of discoveries of viable deposits evaluated favorably based on economic feasibility studies that require significant capital expenditures, Geoexplorers International, Inc. conducts joint ventures with its partner(s), allocating investment capital for development and production.

Geoexplorers International, Inc., during its 47 years of continuous, highly successful activity as a consulting, then as an exploration and development corporation, has provided professional and management services to many large, medium, and smaller corporations, the U.S. and foreign governments, international organizations, and financial institutions.

The company has gained worldwide experience through its extensive operations, particularly in practically focused exploration, finding economically viable mineral and petroleum deposits, including tailings/post-flotation waste evaluation.

### INITIATING OWN AND INDEPENDENT PROJECTS - EXAMPLES FROM RECENT YEARS:

#### • PROJECT I - GEO-WUSA - "PRECIOUS METALS IN THE WESTERN USA"

Exploration proposals for the precious metals, including the platinum group metals (PGMs), rare earth elements (REEs), and other metals hosted in sedimentary rocks, particularly metals found in black shales in the western USA.

- \* *Independent testing and analysis of the content of these metals in ore using our innovative and proprietary "6M-EX" technology for the concentration and extraction of all metals from black shales.*

#### • PROJECT II - GEO-KGHM - "PRECIOUS METALS IN KGHM FLOTATION TAILINGS"

Independent analyses of the content of all precious metals, rare earth elements (REE), and other metals contained in flotation tailings and the current production of KGHM Polska Miedź S.A. (KGHM).

- \* *Independent research and analysis of the content of these metals in KGHM's post-production waste of, using our innovative and proprietary "6M-EX" technology for the concentration and extraction of all metals from black shales.*

#### • PROJECT III - GEO-EUSA - "PRECIOUS METALS IN THE EASTERN USA"

Exploration proposals for the precious metals, including the platinum group metals (PGMs), rare earth elements (REEs), and other metals hosted in sedimentary rocks, particularly metals found in black shales in the eastern USA.

- \* *Independent testing and analysis of the content of these metals in ore using our innovative and proprietary 6M-EX" technology for the concentration and extraction of all metals from black shales.*

#### • PROJECT IV - GEO-CARIBBEAN - "OIL AND GAS IN THE CARIBBEAN BASIN"

Oil and gas exploration proposals in "Seven Exploration Prospects" in a selected Caribbean Petroleum Province.

- \* *Independent studies and recommendations of seven exploration and prospecting programs in the Caribbean Sea.*

#### • PROJECT V - GEO-POLAND - "SHALE GAS IN POLAND"

Exploration proposals for shale gas in Poland.

- \* *Independent research and recommendations on shale gas deposits in Poland.*

## **GEOEXPLORATION EXPERIENCE IN THE EVALUATION AND ASSESSMENT OF OIL AND PRECIOUS METAL DEPOSITS IN OPEN PIT MINES**

It is well known that any mining operation produces dumps and/or tailings. Most of these are generated concurrently with mining operations and ore processing. As a result, numerous mine tailings have been and others are being considered for reprocessing and anticipation for recovery of valuable minerals and metals. Very often, enormous value is retained in the mine tailings. However, this value has been omitted because, most often, the cut-off grade of the ore has been set by the price of the commodity of primary interest in mining, extraction, and production, inadequate ore processing equipment, the technology used, or interest only in some recoverable metals. Examples of such cases are numerous in the mine dumps and tailings.

Geoexplorers International, Inc. and Dr. Jan Krasoń, through worldwide consulting activities, his past involvement in exploration, particularly for non-ferrous and precious metals - including platinum group elements (PGE), have become highly familiar with many typically huge tailings dumps. Many of them, in numerous countries, mine and/or tailings dumps have been thoroughly assessed by us technologically and economically, frequently including an assessment of ore mining potential.

Two flotation projects were huge, and Geoexplorers International, Inc. investigated, evaluated, and sustained experience. In addition to the tonnage of tailings, these two had exceptionally high economic values. They were similar in resource size and potential to KGHM's tailings. A summary of these two projects is as follows:

### **MURUNTAU - WORLD'S LARGEST GOLD MINE IN UZBEKISTAN**

In October 1984, Newmont Mining Corporation, seeking new exploration ideas to be considered and developed over the next five years, invited Jan Krasoń as a speaker to the Annual Corporate Conference. Already having personal data on the type and grade of mineralization and level of mining and being familiar with Russian scientific publications, he presented "Muruntau, the world's largest gold mine in Uzbekistan, as a model for exploration of similar deposits."

Jan Krasoń then wrote "Economic Geology of Muruntau - The World's Largest Gold Deposit" (including 125 pgs. Report, with numerous graphic illustrations and tables). His summary "Muruntau: The World's Largest Gold Producing Complex" was published in a special "GOLD" issue of Mining Engineering, November 1984, pp. 154-155.

At that time and during the period of Soviet domination of Uzbekistan, the Muruntau gold mine, although operational for the previous 25 years, was completely closed to outside visitors. Therefore, some Nemont employees, geologists, and managers were very skeptical about the reliability of the data proposed by Jan Krasoń. Nevertheless, with their "homework" already well done, in 1991, shortly after the collapse of the Soviet Union and the declaration of independence by Uzbekistan, Newmont geologists visited the Muruntau Gold Mine. They confirmed earlier information, collected several samples, and found an intriguing amount of gold in the huge "mine dumps" at Muruntau, which contained pre-crushed rock material containing gold, but with a higher than ore grade amount of 1.5 g/t Au. Moreover, the analytical results of these samples collected by Newmont geologists, especially in the one-ton sample collected during a subsequent visit to Muruntau personally by Newmont's president, contained, on average more gold than the "cut-off grade" concentration.

Jan Krasoń spent numerous days at Muruntau, making detailed geological observations in the huge open pit (i.e., ~300 m deep and ~3 km wide), and in the ore processing plants and mine dumps. As a result, he found that the Muruntau mine had an average ore concentration of 4.5 g Au/t, whereas earlier and at that time, the value was 1.5 g Au/t. However, the most intriguing discovery was about 700,000,000 tons of the aforementioned "dump", averaging at least 1.0 g Au/t. In addition, approximately 6,000,000 tons of similar pre-crushed rock material with similar gold content from current production were added to the "dump" each year.

Newmont acted quickly and successfully entered into a business arrangement and agreement, committing to invest over \$200,000,000 for a 50:50% profit split with the Muruntau gold mine (i.e., the government of Uzbekistan). Newmont introduced heap leaching technology to Uzbekistan and began production in less than two years. The average production rate was approximately 500,000 ounces (17 tons) Au/year, with \$200/oz Au production costs. As a result, the Newmont mining operation at Muruntau became the largest western mining and investment project in the former Soviet Union.

In particular, it should be noted that although Newmont's officials were aware of Jan Krasoń's initiation of the Muruntau Project "because of possible financial liability", Jan did not receive the appropriate compensation and remuneration customary in the mining industry.

## NORILSK MINING AND METALLURGICAL COMBINE IN FAR NORTH RUSSIA

Norilsk Mining and Metallurgical Combine (Norilsk GMK) 1 operates two mines at Norilsk; four active mines and two others are in the final stages of development, including Talnakh (located about 30 km northeast of Norilsk). Two flotation plants process ore from both locations. Three separate smelters process nickel, copper, and pyrrhotite concentrate. Locally produced platinum group metal concentrate is smelted and refined in Krasnoyarsk. The population of Norilsk is approximately 180,000. The population of the region, including Dudinka (located 79 km. west of Norilsk, connected to it by rail), is about 360,000, of which 124,000 people work directly for Norilsk GMK.

The ore of the Norilsk and Talnakh mining districts has complex mineralogy, mining and utilizing mainly nickel and copper with cobalt and platinum group metals (PGM). In addition, gold and silver occur in smaller quantities.

There are two retention reservoirs at Norilsk GMK - an inactive one (operated from 1949 to 1975), known as "Norilsk 1" and an active one from 1976, which has been in operation for 24 years), known as "Lebiazhe" (this one also stores retention waste from the Talnakh flotation plant). The first holds at least 300 million tons of waste materials, which in Russia are known and considered "technogenic ore" (i.e., with an economic value of any metal, including nickel, copper, cobalt, gold, silver, and especially platinum, palladium, which can be recovered profitably). The second reservoir contains at least 150 million tons of similar type tailings or technogenic ore. In addition, as a result of the flotation process, they deposited about 15 million tons of tailings with an estimated 480,000 oz (16.5 t) PGE/year.

Norilsk GMK operates in one of the world's largest ore-bearing provinces of non-ferrous and precious metals mentioned above. Given its PGM content, Norilsk and the nearby Talnakh deposits are considered the richest in the world. According to Johnson Matthey, Norilsk GMK and South Africa in 2003 supplied about 91.2% of the world's total supply of platinum and 82.75% of palladium. In the same year, North America supplied 4.66% of Pt and 13.45% of Pd (Platinum, 2003).

Although Norilsk GMK has been operating on a large scale since 1949, the proven ore reserves are still sufficient for 150 years of mining at the current rate of approximately 12 million tons of ore per year. The massive sulfide-type ore, up to 45 m thick, averages over 20% copper, several percent nickel, and about 30 g/t PGE. Brecciated ore averages 4% copper, 2.7% nickel, approximately 10.8 g/t PGE, 0.6 g/t gold, and 9.9 g/t silver. Ore average of 1% copper, 0.5% nickel, approximately 4.63 g/t PGE, 0.22 g/t gold and 3.2 g/t silver (Distler et al., 1993). M. A. Kaufman speculates that the gross value of the Norilsk and Talnakh deposits must well exceed \$250 billion (see E&MJ, February 1993, pp. 40-43). Given the recent profound political changes in post-communist Russia and its rapid, friendly cooperation with the world's major South African PGE producers, regardless of the current and future investment climate in both countries, close cooperation between them can be expected, including management, technology, production rates, sales, and, above all, prices.

It can also be inferred that due to its huge ore reserves and comparable well established, albeit in the harsh climatic conditions of Russia's Far North, Norilsk mining and metallurgy will have a strong influence on the world market for nickel, copper, and especially platinum group metals for many years to come. Such influence can be caused by Norilsk GMK's partial privatization and acquisition of 58% of Stillwater Mining Corp. in Montana, USA, and trading on the New York Stock Exchange.

The results of participation in the "Open International Competitive Bid for Reprocessing and Commercial Recovery of PGE from the Norilsk 1 Tailings Reservoir" in which Geoexplorers International, Inc. participated were announced on August 6, 1993.

By letter No. 14-322/2618, Norilsk GMK announced that Geoexplorers International, Inc. had won the bid on the same date. As proposed and anticipated, Geoexplorers International, Inc. was awarded the exclusive right with Norilsk GMK, to conduct a detailed evaluation and development of the Norilsk 1 tailings pond, including simultaneous production.

Jan Krasoń promoted the "Norilsk Flotation Tailings PGE Project" and, among others, took a particular interest in this project from EXXON Minerals Corp. and BHP. EXXON Minerals Corp. was ready to invest initially \$50 million. After a special presentation by Jan Krasoń on BHP and the tonnage of the deposits, including the already known factual analytical data, BHP specialists independently confirmed and concluded that the Norilsk Tailings project contains recoverable resources worth \$12 billion.

Unfortunately, due to inadequate confidentiality safeguards against theft of confidential information, the "Norilsk Flotation Tailings PGE Project" was stolen from the headquarters of Geoexplorers International, Inc. A major internationally active bank seized it. Subsequently, Norilsk GMK, using the tailings processing technology recommended by Geoexplorers International, Inc., recovered non-ferrous and precious metals from flotation, particularly platinum group metals (PGMs).

\* Please note that all factual data are from 1993

## OTHER PROJECTS

### ALBANIA - MINING DISTRICTS OF CHROMITE BULKIZA AND KALIMASH

In November 2006. Jan Krasoń visited both mining districts, especially the inactive ore processing and tailings facilities. Evaluating all the data and information collected resulted in developing a Business Opportunities Report. In addition to favorable flotation tailings, evaluation results averaged at least 10% Cr (n.b. in the past, ore processing recovered only ~28% Cr, with an average of ~40% Cr). In particular, the following recommendations of Geoexplorers and Jan Krasoń were considered by the client:

- Additional exploration and development of large proven and potential reserves of chromite-bearing ore deposits.
- Reprocessing of chromite-bearing and platinum-bearing waste rocks from large (at least 100 million tons, open pit mineable) lateritic nickel ores with an average grade of at least 1% Ni were considered.

### AUSTRALIA

Jan Krasoń visited Australia in 1976, 1981, and 1996.

#### VISIT IN 1976

This visit was in conjunction with participation in the **25th International Geological Congress (IGC)**. During the Congress, which lasted ten days, most of the sessions he attended related to sedimentary-hosted non-ferrous metals. He also lectured on "**Geological conditions of the metallogeny and required criteria in exploration for stratiform ore deposits**". Besides taking part in the IGC, Jan visited:

#### IN THE NORTHERN AREAS

- **RANGER 1 & 2, JABILUKA URANIUM RESOURCES 1 & 2, AND NABRALEK**

In 1976, Ranger 1 and 2 reported 110.5 thousand tons of ore in the 0.25-0.35% U<sub>3</sub>O<sub>8</sub> range, Jabiluka 1 and 2 reported 227.8 thousand tons of ore in the 0.25-0.45% U<sub>3</sub>O<sub>8</sub> range, plus >500 thousand tons of ore averaging 13.9 g Au/t, and Nabrelek reported 10.5 thousand tons of ore averaging 0.25% U<sub>3</sub>O<sub>8</sub>. It should be noted that although all of these ore bodies are in chlorite green shales, they were originally Lower Proterozoic black shales and were subsequently retrogressively metamorphosed. They were deposited on the eastern flank of a large lake. Pine Geosyncline, of which on the western flank is the Rum Jungle (n. b. south of Darwin) also with uranium ore body that produced 863,000 tons of ore averaging 0.28 - 0.4% U<sub>3</sub>O<sub>8</sub> and 2.7% Cu.

- **TENNENT CREEK**

Tennant Creek, including the Mining District, is located approximately 550 km SEZ from Darwin. In that vicinity, Jan carefully studied copper and gold deposits in the field and visited the following mines: PEKO Mines, including WARREGO Mine, ACE HIGH KATHLEEN Mine, and Noble's Nob Mine.

In general, all of these mines operate on partially metamorphosed sedimentary-hosted copper and gold deposits. They are confined to regionally and locally deformed Peko Synclines. Sedimentary sequences include shales, siltstones, siliceous dolomites, and minor gray lithic rocks. Hematite schists are common, and the term is being used for a specific rock type, such as hematite schist or clay shale. Hematite schists grade transversely and vertically to bedded clay stones and by iron enrichment to hematite and quartz hematite. A wide range of features in the sediments indicates provenance and depositional environment. Porphyroid intrusions are intermixed with the sediments. It has been concluded that porphyroids have been formed from hydro-mobilized sediments.

The main raw material of all the mines mentioned above is copper with gold and bismuth. During Jan's visit to these mines, the Warrego ore grade averaged 2.94% Cu, 0.18% Bi and 2.9 - 8 g/t Au. However, large ore blocks averaging 100 and over g/t Au are locally present. Concentrate averaged: 25.9% Cu, 1.39% Bi and 22.4 - 40 g/t Au and recovery averaged: Cu 96%, Bi 83.3%, and Au between 82.7 and 54.7%.

Although all the above-identified deposits and ore bodies are considered sediment-hosted, they are different from the Polish copper-silver deposits and ore bodies. However, researchers investigating increased interest in the KGHM "RED-BED-TYPE PRECIOUS METALS IN THE SIEROSZOWICE-POLKOWICE COPPER MINING DISTRICT, SW POLAND." (*Pieczonka, J. et al. 2008, Kucha, H. et al.*) can also learn a great deal by exploring even such remote copper-gold or bodies as those of Tennant Creek Mining District, Australia.

## IN QUEENSLAND

### MOUNT ISA AND MOUNT ISA MINES

Before Jan Krasoń's visited Mount Isa, he was employed by ASARCO, of which Mount Isa Mines (operating under MIM) was a subsidiary. As he was managing the exploration for copper deposits in the sediments at the time, among other things, he carefully studied the Mount Isa deposits. These studies included detailed observations and analysis of some 350 kg of ore samples (n.b. shipped from Australia to Denver, Colorado).

Consequently, his visit to the Mount Isa Mines was of similar interest to the visit, after more than 20 years (Ja was considered "a persona non grata" and forbidden to re-enter communist Poland), to the former KGHM Konrad Mine in 1988, and then to the Lubin, Sieroszowice, Polkowice and Rudna Mines.

Since Polish geologists are certainly familiar with the geology of the deposits and ore bodies of Mount Isa, regardless of the fact that the latter, the main raw materials are Pb, Zn, Cu, and Ag, they are sediment-hosted. The magnitude of their resources (at least initially), the rate of extraction, and the technology of processing the ore, also producing flotation tailings, were comparable to those of KGHM.

During Jan Krasoń's stay at Mount Isa, he also visited the Mary Kathleen Uranium Mine.

The uranium ore, averaging 0.13 U<sub>3</sub>O<sub>8</sub>, is hosted in a more calcareous with massive enrichment (mainly grossular) sediments with an age of 1,500 million years, the same as the ore bodies at Mount Isa. The Mary Kathleen mine produced 17,000,000 t/yr. It has been interpreted and understood that at the Mary Kathleen uranium was leached out of the volcanic breccia pipe and deposited along its periphery within the garnetiferous zone.

Then at TOWNSVILLE (n. b. located 835 km east of Tennant Creek), Jan visited GEPKO's, Mount Morgan Copper.

Mount Morgan Copper ore and gold-bearing ore body were brought into modern mining operations in 1932. After 46 years of open-pit mining, the company moved over 124 million tons of material, including approximately 39 million tons of ore and 85 million tons of overburden, and produced 74,073 kg of gold and 32,270 kg of silver, 222,588 tons of copper, and 578,000 tons of pyrite.

The Mount Morgan ore body was a large, irregularly shaped mass of silica and pyrite that carried gold, copper, and silver mineralization. Host rocks for gold-copper mineralization included embedded rhyolites, dacites, andesites, and quartzite-siltstones with lenses of dolomitic limestone. Much of the host rock sequence has undergone extensive alteration, silicification, fracturing, brecciation, and faulting locally.

### IN THE NEW SOUTHERN WELLS

Jan Krasoń visited the WOODLAWN Copper Lead - Zinc deposit.

This deposit was discovered in 1970 and subsequently developed in open-pit operations by JODODEX Australian Ltd. and ST JOE MINERALS Corporation. Mineralized are Ordovician-Silurian, graptolitic shales interbedded with volcanics. The ore itself is located at the base of acidic volcanics. There are also present post-ore doleritic sills.

Ore deposits developed for mining had 10,000,000 tons of ore, averaging 1.6% Cu, but at the surface, exposed to gossan averaged: 0.47% Cu, 0.65% Pb, 0.09% Zn, 3.17 g/t Au and 500 g/t Ag. With the approval of the mining authority, 50 million tons of waste were planned and permitted to be deposited into the local Lake George.

### BROKEN HILL

Adelaide, 500 km southwest of Broken Hill, is the closest major city.

In 1905, The Zinc Corporation Ltd. was formed in Victoria to recover zinc from the residue accumulated in the Broken Hill field since the commencement of mining and treatment of lead and zinc sulphide ores. In the earlier days of the field, there was no known method to recover zinc remaining in mine tailings economically.

Subsequently, new and larger ore deposits were discovered and successfully developed through various corporate reorganizations. From 1936, Broken Hill Consolidated Ltd, then with Australian Mining and Smelting Company Ltd., operated as Broken Hill Proprietary Company Limited or BHP. Through the acquisition of Billiton, it changed its name to BHP Billiton Limited and became the world's largest mining company.

In 1976, Jan Krasoń also visited Broken Hill Mines and made his observations on the surface and underground mining excavations. As a result, he learned much more about one of the world's largest deposits of silver-lead-zinc minerals.

Then in the 1990s, he was retained by BHP-Billiton Ltd. and had the privilege of providing his own consulting services.

## WESTERN AUSTRALIA

First, Jan Krasoń visited **Alcoa's Jarrahdale Bauxite Mine**.

Bauxite mineralization in the area south of Perth, particularly within Jarrahdale Mine, has been developed and rests on the granodiorite. Within the mine, the bauxite veneer is on average 5 m thick and contains 35% Al<sub>2</sub>O<sub>3</sub>. It covers about 30 square miles, with a cut-off of 27.5% Al<sub>2</sub>O<sub>3</sub>. Bauxite ore contains 25 – 30% Fe<sub>2</sub>O<sub>3</sub> and about 1.3% SiO<sub>2</sub>. The upper part of the ore is enriched with vanadium. At the time of the said visit, Jarrahdale Mine mined 10,000 t/day of bauxite ore. Ore grade and thickness were controlled by 15 m deep holes drilled in grid 15m × 15m and geochemical analysis. Areas mined out were immediately recultivated with local vegetation.

Although at the time of Jan Krasoń's visit to Jarrahdale Mine, bauxite was not his primary interest. In 2008 Australian CSIRO, Research Branch in Perth, Dr. Rob Hough (the leading author), announced his findings in **"Nanoparticles of gold found in Western Australia Clays"**, eventually found in Jarrahdale Mine bauxite or similar saprolite or laterite. According to CSIRO News Release, "Clays from the fracture surface were analyzed. **There was no gold visible, but analysis showed the clays contained up to 59 parts per million of gold.** The research team concluded that the nanoparticles of gold had imaged represented the **"invisible gold"** in the clay, and this **nano-sized gold** was common in a similar environment."

## KALGOORIE

Kalgoorlie is located about 613 km east of Perth. In 1976 Jan Krasoń visited **Charlotte Gold Mine, owned and operated by Western Mining Corporation**. The visit included observations on the ground and in the underground mine excavations. In the Charlotte Mine, gold was found in the quartz veins and potassic-altered zones, which occur within locally silicified dolerite. There was 3.3 million ounces of ore that averaged 5.3g/t Au. At the time of Charlotte's Mine development and Jan's visit, the cut off grade was 3 g/t Au.

The visiting and detailed ground surface observations in the **Kalgoorlie, Coolgardie, and Boulder** (n.b. repeated by him in August 1981), a very well-known **sizeable gold-bearing mining district, involved particularly old miner's tailings covering a large area. The presence and extraction of gold from gold-bearing lateritic cover by small miners, who produced >39 million ounces of gold, led to the gold's discovery and mining out of the above-identified hard rocks ore bodies.**

**Kambalda town and Kambalda Nickel Mines** are located 75 km southeast of Kalgoorlie – Coolgardie, geologically within Archean Yilgran Block, a cratogenic unit.

At the time of Jan Krasoń's visit to the area and the **Juan Mine**, he has learned and observed that at Kambalda's, about 80% of nickel occurs within olivine-rich peridotite. But observations in the larger vicinity of Kambalda show that overall nickel mineralization and its other ore bodies occur within ultrabasic, basic, and acid volcanics and associated sedimentary rocks. At the time of his visit, Kambalda Mines produced 60,753 tons of ore/year, averaging 2.2% Ni.

However, it has been reported that in 2010 Australian Mincor Resources only from South Kambalda Operations produced 244,352 tons of dry ore with an average of 2.65% Ni. The North Kambalda Operations produced 109,701 tons of ore with an average of 3.36% Ni.

The primary purpose of Jan's second visit to Kalgoorlie (in August 1981) was to conduct a **Workshop on "The Hydro-Geochemistry as Exploration Approach for Base and Precious Metals."** That Workshop he conducted for staff professional geologists and engineers of Western Mining Corporation.

**In Western Australia**, he also visited **Newman Iron Mine**, owned and operated by **Mount Newmont Mining Company**.

At the time of Jan's visit, Newman Iron Mine operated on a 777 sq. km mineral lease, with 1.2 billion tons of proven hematitic-type ore reserves, with 54% Fe/t, including 350 million tons of high-grade ore averaging 63.5% Fe. The production rate was 40 million tons of iron ore per year. The main part of Newman Mine, obviously open-pit, was located 425 km east of the town of Port Hedland with the seaport where iron was transported by railroad trains for export. Jan also visited Port Hedland Sea Port facilities.

**Such giant mining operations also face enormous environmental problems and challenges. Issues like; the need for dust suppression within the mine and railroad truck, water supply, irregular torrential rains causing dangerous water flooding, and recultivation were also brought to Jan's attention.**

As the result of the above-summarized observations and knowledge gained in Australia, by order of Kennecott Exploration Inc., **in June 1980, Jan Krasoń completed a very extensive study on "Uranium Deposits in Australia, Concepts in Exploration for New Deposits and Districts."**

## VISIT TO AUSTRALIA IN 1981

This visit **was also in conjunction with the** 5th Australian Geological Convention on “**Sediments Through Ages**” held in Perth.

Before the Convention, Jan Krasoń also participated in the **Work Shop** on the “**Modern Carbonate and Evaporated Sediments of Shark Bay and Lake Macleod, Western Australia**”.

**The WorkShop** was led by Dr. Brian W. Logan, Professor of Sedimentology and Marine Geology Group, Department of Geology, University of Western Australia.

Instructions and field observations began out of **Geraldton – Carnarvon**, located about 790 km north of Perth. They were conducted out of Western Australian University Sea Vessel, intermittently onshore, offshore, and along the beaches. Special attention was drawn to observations of the features and characteristics of the shallow seawater sedimentology, and algal mats development associated with other plankton flora and macrofauna. Extraordinary observations were made on recently grown and uniquely well-developed stromatolites - some as high as 2 m. They are widespread in a large area at Carbla Point, at Shark Bay, known worldwide. **See Photos**.

After observations made out of the ship and onshore along the beaches, participants of the WorkShop were provided small planes for relatively slow-low-height flights over Shark Bay, then over the large Macleod Evaporate Basin. Then, observations were made on the ground, including the evaporating sequence in the cross-section variety and quality of salts produced from the solar and open pits within Lake Macleod.

Certainly, WorkShop Education, with extraordinary direct observation offshore and onshore, caused provoking thoughts. Lessons learned by Jan in the Shark Bay and Lake Macleod were very beneficial in understanding, eventually similar sedimentological and paleogeographic conditions transitional between Rothliegend into Zechstein that could occur at least in the North-Sudetic (northwest) and Fore-Sudetic (southwest) region of Poland.

Jan Krasoń lectured on “Sediment-hosted ore deposits of the Permian Metallogenic Epoch” during the Convention mentioned above. Lecture, besides world-class of KGHM Polska Miedz, S. A., already mined out copper-silver deposits of Mansfeld-Sangerhusen and other areas in Germany, widespread copper occurrences in the U.S. Permian Basin and the type-locality of Fore-Ural Mountains, Permian Basin.

As an immediate result of said lecture, followed by discussion and meetings at the Convention, Jan has been invited to share his information and ideas with:

- **CSIRO Branch Office in Perth**  
Lecture delivered for interrelated discussion carried with scientists and staff researchers in Perth.
- **Utah Development Corporation, n.b. later acquired by BHP**  
Jan lectured and provided on-site consulting in **Brisbane**.
- **BHP Branch Office for South Australia**  
Lecture delivered in **Adelaide**. After that and discussion with **BHP** Branch Manager and staff geologists, Jan was also requested to log core samples of black shales out of exploratory holes drilled somewhere in the vicinity of the Warloo Copper Mine, at the western flank of the Adelaide geosyncline, north of Adelaide.
- **Bureau of Mineral Resources – later named and presently known as Geological Survey of Australia, Headquarters in Canberra**  
The lecture was delivered, and subsequent, extensive interrelated discussion was held with a large group of staff scientists and researchers.
- **Goldfields Co. Ltd., Branch Office in Canberra.**  
Jan Krasoń lectured and delivered interrelated consulting for the staff geologists.
- **CRA, Branch Office in Canberra.**  
Lecture and interrelated consulting were delivered, and a very extensive, broad discussion was held with staff geologists.

### **CSIRO Branch Office in Sydney**

Jan delivered a lecture, and subsequent extensive discussion was held with large team of staff scientists and researchers. After that, he visited CSIRO laboratories and research facilities, particularly interested in those applied for geochemical and mineralogical analysis and related research.

Later, Jan found out that **Jododex's** geologists flew from their office in Canberra to attend his lecture in CSIRO.



**VISIT TO AUSTRALIA IN 1996**

This visit to Australia was related to the “**Conference on “Resources ’96” organized by Mines & Energy South Australia**, held in Adelaide in December 1996.

Although many good lectures and worthy of considering ideas were presented during the conference, the primary purpose of Jan’s attendance was to visit the **Olympic Dam Mine**.

It should be noted that in the 1970s, **Western Mining Corporation (WMC)** explored for stratiform or sediment-hosted copper deposits. Such copper mineralization was already known from Adelaide Supergroup sediments of South Australia. Mount Gunson old small miner’s mine, was of particular interest to WMC. Initial exploration was already committed. However meanwhile, Mines & Energy South Australia released a newly completed surveyed map (n. b. 1:250,000). Such maps were publicly available. On the map, in the vicinity of Roxby Downs, WMC geologists noticed the evident magnetic anomaly. That became intriguing, and despite the Roxby Downs area being far from Mount Gunson, WMC geologists and management decided to check it by exploratory drilling. They drilled ten holes, and their results were mixed. Some of the ore grades of copper mineralization found some gold and uranium. However, there was no stratiform type mineralization. Initially, it was believed that mineralized found was of some other type – eventually, associated with weathered granite?

Therefore Western Mining Corporation (WMC) approached numerous companies searching for co-investor or investors to avoid further exploration risks. **At that time, one of such companies also asked Jan to evaluate the results of those ten-drilled holes. But unfortunately, he was also hesitant to recommend it favorably.**

Then finally, WMC found BP. This one committed co-investment to further exploratory drilling and eventual development and acquired 49% of the equity interest.

The rest of the history of the Olympic Dam is already well known. Among others, it has been reported that Olympic Dam is located 560 km north of Adelaide. It is also known that Olympic Dam was brought into production in 1988.

It is the 4th World’s Largest copper + silver deposit, 5th largest gold deposit, and the largest uranium deposit.

All underground mining produces about 200,000 tons of copper, 25,000 kg (804,000 oz) of silver, 4,000 tons of uranium, and 28,000 kg (90,000 oz) of gold per year.

Certainly, KGHM is also aware that BHP Billiton, after additional, already committed investment in the 2013 Olympic Dam, will mine 72 million tons of ore, 730,000 tons of copper, and 19,000 tons of uranium oxide, and 25 tons (804,000 oz) of gold per year.

**Environmental considerations at Olympic Dam operations are unimaginable and comparable to those faced by KGHM in its operations.**

**This is why Jan strived to visit Olympic Dam and did so after almost ten years of operation, and similarly to KGHM, continuously kept following up-to-date information.**

**BOLIVIA - TIN AND GOLD IN ORURO AREA - ALTIPLANO REGION**

In the Oruro area, Jan Krasoń visited almost all past and presently active mining operations, particularly observing small miners’ operations, studied geological features, assembled and studied relevant literature and found that gold occurs within Miocene age Kholpana Formation.

The Kholpana Formation is confined to one of the Altiplano basins resting on folded and faulted, Upper Ordovician-Upper Devonian age sequence (total almost 2,000 m thick). In some areas of Altiplano, Lower Paleozoic sediments-host base metals, tin, silver, and gold mineralization with gold-bearing quartz veins. overlaid by glacio-marine and red-clayey sediments, alternating micaceous sandstones, siltstones, and black shales, partially overlaid by Soledad Volcanics and Pleistocene - Recent sediments.

Although small miners active in the basin apply the extremely primitive procedure of gold extraction, recovering on average 1g Au per miner per day at least some of the findings range from 8 to 10 g Au/m<sup>3</sup>, and sometimes as much as 180g Au/m<sup>3</sup>.

Despite extensive observation made in the field, it is still insufficient for reliable assessment. Nevertheless, gold resource potential is good in the Kholpana basin, considering the amount mentioned above - wide horizontal and significant vertical distribution of gold.

**Eventually, there might be at least 5,000,000 mineable ounces of gold, averaging recoverable at least 1 g Au/m<sup>3</sup>.**

**CANADA – ALBERTA, BRITISH COLUMBIA, AND NOVA SCOTIA****IN ALBERTA – KIMBERLEY AND CRANBROOK AREAS**

Jan Krasoń, during employment by **Asarco**, visited and thoroughly studied the Sullivan Lead and Zinc Mine, then explored for similar type sediment-hosted deposit mainly within brecciated, quartzitic, silty, organic-rich sediments of Proterozoic age. It should be noticed that Asarco discovered the Sullivan lead and zinc ore body. Then, because of very fine grains of the Pb and Zn – bearing minerals, **Asarco**, despite of being a major mining company and the owner of most of the metallurgical smelters in the US, Canada, and Mexico, was unable to solve the metallurgical problem. Finally, in 1918 Canadian **Cominco** acquired the Sullivan ore body, solved the metallurgical problem, and Sullivan, for many years, became the largest Canadian Pb and Zn Mine.

**IN BRITISH COLUMBIA**

Jan Krasoń, working for **Asarco**, then when consulting for **Anaconda**, visited and thoroughly studied several major mines and mining operations, including **Endaco** Molybdenum Mine, **Britania** Copper Mine of **Anaconda**, **Texada** Copper Mine on Vancouver Island, **Granby** Copper Mines (of porphyry type) and **Endako Placer Development Ltd.**, **Molybdenum Mine**, and **Gibltartar Mines Ltd.**, a Copper Mine, in NW British Columbia.

**Then when exploring for new copper deposits, among others, he visited numerous areas. For example, in the Kamloops area, he briefly visited, examined, and evaluated AFTON, AJAX, CRESTON, and PATHLOOK deposits, recently acquired from ABACUS by KGHM.**

**IN NOVA SCOTIA**

When consulting for **Shell Resources, Inc.**, among others, in the vicinity of Cape Breton, he thoroughly examined the mineralization of the **Yava** Lead and Zinc Mine.

It is very interesting to notice that in the **Yava Mine**, metalliferous mineralization is hosted in the sandstones and is distributed and concentrated almost exactly like copper-silver mineralization in the Weissliegende of **KGHM's** Rudna Mines. Mineralization in the Yava Mine is hosted in the Lower Carboniferous Age sandstones, directly overlaid by highly bituminous limestones interbedded with silty shales of the Windsor Formation.

**CHILE – COPPER WITH GOLD PROJECT**

In 2007 main objective of Jan's visit to **LA LIGUA - TILAMA** Project located 235 km north of Santiago was to examine the prior mine workings – prospects and evaluation of the economically viable ore body potential. Anticipated was porphyry-type copper with gold mineralization and the potential of a mineable tonnage of ore-grade reserves. Observations in the field found that Cu with Au of chalcopyrite and bornite type mineralization occurs along the contact zone between dark-gray limestone and andesitic-type volcanic. Locally they appeared to be of significant ore grade, but because no supporting indications were found for a mineable ore potential reserves, the interest in the project was subsequently dropped.

**EGYPT**

Jan Krasoń, as a recipient of the post-master degree scholarship, was admitted to the **Cairo University** in Egypt, where he spent the entire year 1959. Meanwhile, together with with the **Geological Survey of Egypt** he participated in several Geological Expeditions and jointly explored various mineral deposits. First, in the vicinity of the Baharia Oasis, in Western Desert he mapped and in detail sampled, assessing potential iron ore reserves. Then in various parts of the Eastern Desert of Egypt he explored and evaluated various mineral deposits, including copper (of massive sulfides), lead and zinc, uranium, chromium with PGE, iron, and phosphate with REE.

In April through June 1975 and later in 1979, in Egypt, he made a detailed evaluation of the base and precious metals potential in the Eastern Desert of Upper Egypt. He carried out the Project for former Trans-World Egyptian Petroleum Corporation, a St Joe Mining Corp subsidiary. Among others, said evaluation included old mining tailings and potential deposits of old mines, including Omo Samiuki – with massive sulfides copper and nickel mineralization, Darhip Copper Mine and its tailings, Abu Galaga ilmenite deposit, Hamesh Copper Mine, Umm Gheig Lead – Zinc Mine, and ancient Egyptian El Aradiya gold mine workings and tailings.

Since 1995, in the latter general area, located 28 km west of Marsa Alem situated on the coast of the Red Sea, a new gold deposit has been discovered. By very extensive drilling, 7,000,000 ounces of gold have been well proven. Gold Mine began operating under the name Sukari Gold Mine. Pharaoh Gold Mines, a wholly-owned subsidiary of Centamin Egypt Ltd. and the Egyptian Mineral Resources Authority, jointly own the mine. The mining operation began in February 2009 and intended to produce 200,000 oz Au/y.

**FIJI – GOLD IN VUNDA AREA**

The project evaluated old and recently made mine tailings after poorly extracted gold mainly from gold-bearing laterite, developed primarily in the Shoshonite basement. However, the primary objective was initial exploration for economically viable mineable gold-bearing deposits.

## GHANA - GOLD IN OBUASI AND TARKWA AREAS

In 1987, Jan Krasoń evaluated old and recently accumulated mine waste at Ashanti Gold Mines following extraction of gold, primarily from gold-bearing quartz veins in carbon-rich siliceous greenstone-type ore.

## GHANA - POLISH-AMERICAN-GHANAIAI JOINT VENTURE

Two projects were initiated by the President of Ghana, Jerry J. Rawlings (considered Ghana's savior), and his personal friend and influential former Chief of Staff of the Ghanaian Forces, General Ashley-Lassen.

- **Mining Project** - Jan advised his American and Polish clients on the possibility of a Joint Venture between the Government of Ghana and reputable American and Polish companies represented by their owners (Henryk Korol and Ryszard A. Korol). This mining project aimed to extract gold and diamonds in collaboration with some of the largest Polish foreign trade companies, including; Bumar, Dromex, Budimex, Chemadex, and others.
  - \* *This mining project fell apart because of the turmoil caused by the fall of the communist government in Poland in June 1989. As a result of the fall of this authoritarian system, many drastic and personal changes have taken place.*
- **Jewelry Project** - Jan actively participated in the talks concerning the jewelry project in Ghana. Advised on the possibility of a Joint Venture between Korol Creations, Inc. of USA and Foreign Enterprise "Kortex" of Poland and the Government of Ghana to train people in the western jewelry and souvenir production techniques by utilizing most of the gold and diamonds mined domestically. The first phase of the project included training 5,000 people.
  - \* *This jewelry project was abandoned because, in the meantime, the leading partner of the proposed Joint Venture, Ryszard A. Korol, obtained a very competitive and lucrative offer from the Polish government to built the jewelry industry in his homeland - Poland.*

Again in 2007 and 2008, Jan Krasoń visited Kabriso Gold Mining's operations on very rich alluvial clay sedimentary deposits (averaging ~20 g Au/m<sup>3</sup>). This resulted in a preliminary assessment of potentially larger ore reserves, including gold and platinum within widespread thick lateritic cover reaching several meters.

## HAITI – GOLD AND COPPER

In Haiti, Geoexplorers International, Inc. and personally Jan Krasoń has been active since 1981. Initially, he provided consulting services for United Nations Development Program (UNDP) and UN Revolving Fund, then for Inter-American Bank (IDB), the Government of Haiti, and numerous major and junior mining corporations. Jan's activity in Haiti resulted in discovering three gold deposits, which have been developed into production, also by Newmont Mining Company.

**Before and in 2007, copper with an average of 0.5% and 1 g/t of gold in a minimum of 500 million tons of ore was well documented and partially proven by exploratory drilling. Jan highly recommended this project to KGHM.**

Geoexplorers activity in Haiti, among others, included evaluation of the **flotation tailings** after extraction of copper with a lesser amount of gold, produced from the skarn-type ore body of a former **MEME Mine**, located 16 km north of Gonaives, the third-largest city of Haiti. Besides old mine tailings, there are still relatively good geological premises indicating a minimum of 6,000,000 tons of ore, averaging ~2% copper with 1g/t gold.

## KAZAKHSTAN – NONFERROUS METALS INVENTORY OF THE MINE TAILINGS

Besides the 2007 evaluation of the most likely major oil potential within Western Zharkamys II and Karmakir Exploration Concessions, located near Aktobe (former Aktyubinsk), in Western Kazakhstan, in 1987, **Geoexplorers International received a complete Inventory of all Mine Tailings, mostly of nonferrous and precious metals, in entire Kazakhstan**, including Almalyk, a major copper mine located in Uzbekistan. At that time, Geoexplorers International and Jan were requested to promote those tailings to potential investors for the acquisition, development, processing, and, more efficient than before, recovery mainly of base and precious metals.

Jan visited and evaluated many of those mine tailings, including **Dhezhkazan Cooper Mine** (n. b. generally similar to KGHM mines)d. Evaluation entailed flotation tailings in Kazakhstan, Uzbekistan, Russia, Ukraine, and others in Central and Eastern Europe, Africa, the USA, and Canada.

Generally, American and Canadian companies' attitude toward the "mine and flotation tailings business" is negative. However, Newmont reversed that attitude in **Muruntau**. A major Canadian gold producer jointly with **Goldbelt Resources, Pegasus Gold** took the "tailings project" seriously in Kazakhstan. Goldbelt Resources, at the investment of US \$3,000,000, acquired 102,000,000 tons of tailings assaying 0.74 g Au/t and 5.71 g Ag/t, with proven reserves of 1,600,000 oz of gold, 5,400,000 oz of silver. Goldbelt Resources, from its tailings project in Kazakhstan, planned to produce 151,000 oz of gold and 720,000 oz of silver annually.

## **MEXICO – GOLD IN SYNORA, OXACA, NUEVO LEON, SAN LUIS POTOSI AND OTHER STATES**

From 1984 through the 2010s, Geoexplorers International, Inc., particularly Jan, visited numerous mining districts in Mexico. He evaluated particularly copper, silver, and gold potential, including mine tailings and placer type deposits. Moreover, **Zeolithos de Mexico, S. A.**, independently registered in Mexico, is wholly owned by Geoexplorers International, Inc., which owned four exploration concessions covering 605 hectares of terrain and has the potential for over 100 million tons of open-pit mineable reserves of the clinoptilolite-rich zeolites.

## **NICARAGUA – GOLD AND COOPER**

In Nicaragua, Jan Krasoń visited several mining sites and areas, evaluating particularly the potential for gold and copper deposits, followed by an investigation of the land status and areas open for acquisition. However, initial investors changed their minds when much bigger capital was necessary and subsequently withdrew their interest in Nicaragua.

## **PANAMA – GOLD AND COPPER**

In Panama, Spaniards discovered gold in 1502. Subsequently, they mined out 30 tons of gold (964,530 oz of Au), mainly of placer-type deposits from Varaguas Province. In the 1960s, **Stefan Wleklinski** (n. b. Polish, residing in Argentina), employed by UNDP, thoroughly examined all old mines and former prospects, including **Margaja Copper Mine**. S. Wleklinski (whom Jan contacted already in the 1960s, still in Poland, then met him in the UN Headquarters in New York), authored an excellent – high-quality Report (n. b. dated 1964).

In 1980 and 1987, Jan followed S. Wleklinski's recommendations. In 1980, he spent over 30 days sampling and evaluating gold mineralization in very heavy jungle, mainly of the Rio Concepcion tributaries, then in 1987 also in other areas of the Varaguas Province.

As a result, the **Sea-Lease Panama Ltd., S.A.** acquired some properties, followed by several exploratory drilling, but because of insufficient funds stopped further activity in Panama. Nevertheless, in Panama's same general area, Texasgulf, Inc. discovered a major copper deposit. They proved to be a big – mineable ore body, but subsequently, **Elf Aquitaine Oil Co.** acquired Texasgulf, Inc., and then dropped mining activity.

## **PHILIPPINES – CHROMITE IN THE DINAGAT ISLAND**

In 1991, Jan Krasoń's assignment and the project's scope in the Philippines by and for the UN Revolving Fund, financially sponsored by Japanese **Marubeni Corporation**. Project included an in-depth evaluation of the rate of production, recovery, and production costs. Moreover, his main task included investigating and determining the tonnage of high-grade chromite ore, unofficially smuggled and shipped to China by Chinese vendors without paying any taxes to the Philippines Government.

## **RUSSIA**

Jan Krasoń (as a US Citizen and scientist) began traveling to the former Soviet Union in 1984, already at that time and for several subsequent years through the 1990s. **Each time he has been invited and considered a guest of the Soviet Academy of Sciences. At that time, he attended and lectured at numerous international and Soviet scientific conferences, visited scientific institutions and mining operations, including particularly gold mines in the Amur Region, Buriatia, Yakutia, Khabarovsk Krai, Primorye, Sakhalin, Magadan Region, Kamchatka, Gornyi Altay, Novosibirsk Region and others places in the European Russia.**

In 1990 Geoexplorers International, Inc. won a highly competitive Research Project and was awarded a contract by the U.S. Bureau of Mines. The scope of the Research Project involved gathering information and data for the US Bureau of Mines Minerals Availability System (MAS). Said scope included 34 mineral commodities of the entire former Soviet Union, including assessing mineral reserves and resources, determining the mining and ore processing technology, and its capacity. Performance of the U.S. Bureau of Mines Contract involved Geoexplorers International, Inc., professional staff, and about 30 Soviet professionals and scientists, including professors and academicians. By mid-1991, numerous Profile Reports of MAS had been completed. But because, particularly in 1990 and 1991, there were many Aeroflot aircraft crashes and accidents, the US Department of State warned all to consider traveling precautions to avoid eventual US Government liabilities (i.e., including Geopexplorer's personnel as the US Government Contractor). Therefore, after about 30% advancement of the Contract, the US Bureau of Mines stopped its further execution.

Subsequently, for the following five years, **BHP-Billiton** Limited retained Jan as Senior Geologist with assignment for New Business Development, mainly in Russia and the Newly Independent States of the former Soviet Union, Poland and Romania. Using the said opportunity, he visited many areas, particularly those with already identified and proven ore reserves of gold and nonferrous metals, including visiting and evaluating big **Volnogorsk** and **Irsha Titanium-Zirconium** Mines in Ukraine. In Uzbekistan, besides visiting the giant **Muruntau Gold Mine**, he also visited the areas and briefly examined documentation referring to major gold-bearing ore bodies; **Daugustau, Amantaitau, and Vyskovoltinye**.

**UNITED STATES OF AMERICA**

Jan Krasoń has been professionally active since arriving in 1969 and settling permanently in Denver, Colorado. Initially, Texasgulf, Inc. employed him. He managed (staff of six geologists, among others, equipped for most of the time with a helicopter) exploration, mainly for copper and associated gold, in Arizona and New Mexico, with irregular assignments for Nevada and Western Texas projects. At that time, in Arizona and New Mexico, he visited all copper mines (n.b. producing >30% of the US total production) and thoroughly studied their deposits. Having considerable knowledge of those, he examined and evaluated many areas and properties with geological characteristics indicating the potential for discoveries.

Then when being employed by ASARCO, he explored for sediment-hosted copper deposits in the US Permian Basin for almost two years, mainly in Texas and Oklahoma. Meanwhile, he visited, examined, and sampled many – probably most ground surface outcropped copper occurrences in both states. At the same time, he logged and sampled cuttings out of tens of oil wells and collected thousands of samples for geochemical analysis. Then he evaluated their analytical results and authored numerous reports, maps, cross-sections, and others.

After about two years of exploration in the US Permian Basin, ASARCO became impatient. Finally Jan was assigned for exploration of also sediment-hosted copper and silver deposits within the Belt Supergroup in western Montana, Idaho, and Alberta, Canada. After visiting operating mines and becoming generally familiar with the geology of the Cordilane Mining District in Idaho, Jan, as one of the first, visited, examined, and sampled (n. b. in underground edits) of earlier discovered by Kennecott Exploration Inc. Spar Lake copper with silver deposit. Contrary to the earlier Kennecott evaluation, evaluation by this author for ASARCO became favorable. Then, Spar Lake (later renamed Troy Mine) became the US's largest silver producer for many years.

In 1974 he established his consulting activity under Geoexplorers International, a Colorado corporation. This corporation has been active (without interruption), employed up to forty staff professionals, and temporarily contracted specifically qualified end-experienced consultants. Among many—mostly exploration projects, except those identified overseas— many more covered various parts, particularly US western states, including Virginia, North Carolina, Pennsylvania, New Jersey, and Georgia.

In Colorado, Utah, Wyoming, California, Idaho, and Montana, Geoexplorers International, Inc. examined and evaluated mine tailings, particularly their environmental impact, and assessed potential economic validity.

**Moreover, during the last several years of Jan's life, Geoexplorers International, Inc., identified, generally similar to KGHM's black shales. Our already extensive sampling of which analytical results indicate mineralization in sediment-hosted precious metals, including ( group elements) PGE, and potential for ore-grade major deposits.**

Because of Jan's prior (i.e., since 1953) involvement in the research on Polish copper-silver deposits, his priority interest has been in the sediment-hosted base and precious metals deposits, including up-to-date information referring to KGHM's ore bodies and mining operations. Among others, it is well known that despite the genetic-related factors, over 6,000 tons (i.e., >192,907,380 oz) of gold in Nevada, the second-largest concentration of gold is sediment-hosted. Therefore, using opportunity when having projects in Nevada, particularly during consulting for Newmont Mining Co., Echo Bay Mining Corp., and others, several times he visited various gold mines. In addition, he regularly attended International Symposia organized by the Nevada Geological Society, always combined with visits to various active gold mines. The latest Symposium that he attended was held in May 2010. Before that, he participated in three days visits to five major – all very big, open-pit gold mines (sharing the most up-to-date information).

**TANZANIA – GOLD AND DIAMONDS**

In 1988, in conjunction with the US Congress embargo imposed on South Africa, as pressure against apartheid, the US Department of States contracted this author to explore and evaluate mineral deposits potential, particularly precious metals and chromium, as an alternative resource for the US import and supply. For about one month, Jan visited and briefly examined most of the mining operations in Tanzania, particularly gold mines and Medui Diamond Mine, operating in one of the world's largest kimberlitic pipe. In Tanzania, out of 240 already identified kimberlitic pipes (at that time, i.e. in 1988), 44 contain diamonds.

**VENEZUELA – GOLD AND DIAMONDS**

Since the 1970s, particularly during the 1990s, Jan has visited Venezuela numerous times. Particularly in its eastern regions, he examined most gold and diamond mining districts and mine operations. He assembled most of the literature and many unpublished reports, geological and other maps. Then, Geoexplorers International, Inc., on its own, acquired two exploration concessions. Because of politically unfavorable climate conditions, most foreign mining companies, including Geoexplorers International, Inc., withdrew their interest in Venezuela.

**ZIMBABWE – GOLD AND PLATINUM GROUP METALS**

Jan's assignment for Zimbabwe in 1988 was also by the US Department of State. It was for the same reasons as one of the earlier assignments in Tanzania. Also, in Zimbabwe, Jan's visited and at least briefly examined most of the gold and chromite mines for one month, including their smelters. Then, in greater detail, he examined and studied chromite with platinum group mineralization within the Great Dike of Zimbabwe. That includes Mimosa Platinum Mine, formerly owned by Australian Delta Mining Company, subsequently acquired, developed, and operated by BHP – Billiton Corp.

***Please notice that photographic illustrations and more detailed information are also available for most mentioned areas and mines above.***

**DR JAN KRASOŃ**  
**SUMMARY OF CURRICULUM VITAE**

**Dr. Jan Krasoń** graduated from the University of Wrocław with a Master's degree in geology and a Ph.D. degree in geology. He was a student and later an assistant of the world-famous geologist Professor Józef Zwierzycki. Both scientists were firm opponents of communism. He worked at the same university (1956-1966) as a researcher and associate professor. In 1959, as a postgraduate research fellow, he studied for a year at the University of Cairo, Egypt. During the same period, he participated in various research projects conducted by the Geological Survey of Egypt.

**Between 1966 and 1969**, as a project geologist in Libya, he contributed to the discovery of a large salt deposit located in the large Sakha (at that time, this discovery was the basis for the development of a chemical plant with a billion-dollar investment). He then served as an expert and advisor to the government of the Kingdom of Libya on the development of various mineral and water resources.

**In 1969**, he immigrated to the USA with a career preference and settled permanently in Denver, Colorado. As a Senior Exploration Geologist and Regional Manager, he worked for Texasgulf, Inc. and Asarco, Inc. (exploring primarily for non-ferrous and precious metal deposits). From January 1973 to August 1974, he worked for the State of Colorado Division of Water Resources.

**In 1974**, he started his own company, Geoexplorers International, Inc. in Denver, Colorado, USA, which has been in continuous operation ever since. As a professional consultant and project manager, he has served approximately seventy clients, primarily mining and oil companies, government agencies, and various international and financial institutions, including the United Nations (UN).

- Personally, Dr. Jan Krasoń had over 50 years of worldwide professional experience searching for economically viable mineral and petroleum deposits, including: practically oriented exploration and evaluation of a wide variety of mineral and hydrocarbon resources, geological and hydrogeological mapping, special environmental audits, and management.
- He had extensive specialization and expertise including, knowledge of volcanic, and sedimentary gold exploration and other precious and base metals, especially those related to hydrocarbons.
- He had extensive experience in basin characterization, formation definition, stability and resource evaluation of gas hydrates and conventional hydrocarbon deposits - particularly those found in the marine environment.
- Since 1974, and continuously for over 40 years, he served as President and CEO of Geoexplorers International, Inc., a highly reputable consulting, research, and exploration corporation.
- Professionally and as a business developer, he has been active in many countries around the world, including the USA, Canada, Mexico, Central, and South America, the former Soviet Union, then Russia, Central Asia, Central, and Eastern Europe, the Middle East, Africa, Southeast Asia and Australia.
- Jan Krasoń has personally worked and lectured in over 60 countries. Since the early 1980s, he initiated multi-million dollar mineral and oil industry projects in the former Soviet Union and later in Russia and the Newly Independent States, Central and Eastern Europe.
- He had international experience in acquiring properties and negotiating related interests. Trained students and corporate, and professionals, conducted courses, seminars and workshops for various associations, government agencies, and international organizations.
- In October 1986, Jan Krasoń, as an invited speaker at the Newmont Mining Corp. Annual Conference, presented "Muruntau - the world's largest gold mine" in Uzbekistan and recommended it as an exploration model. This presentation, among others after the collapse of the Soviet Union, generated interest and resulted in Newmont's involvement in the Muruntau business, with the consequent benefit of producing approximately 500,000 troy ounces of gold per year at production costs of less than \$200 per ounce.
- Jan Krasoń consulted and participated in the developing a privatization strategy, investment opportunities, and strengthening the management of government institutions and organizations.
- Developed (together with his partner, Ryszard A. Korol) the proprietary metal concentration/extraction technology „6M-EX” to recover all the precious and base metals found in the complex ores, especially in the organic-rich black shales and flotation mine tailings.
- He authored and co-authored over 140 scientific publications, including geologic maps, wall posters, professional papers, newsletters, separate books, articles, abstracts, and critical reviews. Jan Krasoń has written about 300 unpublished and proprietary reports for companies and government agencies.

**RYSZARD A. KOROL**  
**CURRICULUM VITAE**

**AREAS OF EXPERTISE:** Technology, Jewelry, Metallurgy, Research

- A scientist who focuses on R & D relating to the extraction of precious metals from different ores and mine tailings.
- An entrepreneur who specializes in developing technologies that provide solutions to the worldwide problems associated with the mining and jewelry industry.
- Invented and introduced many proprietary production techniques into the jewelry industry.
- Metallurgist (mineral expert) **specializing in the extraction of valuable metals from their ores.** He oversees, develops, and tests processes used in metal extraction, alloying, and casting of materials to produce commercial metal products.

**PROFESSIONAL EXPERIENCE**

**2011-Now - Geoexplorers International, Inc.** - Denver, Colorado & New York, N.Y. - *President & CEO*

The company was established in 1974 in Denver, Colorado, by a world-renowned geologist, Dr. Jan Krasoń and ever since has been active worldwide. Primary activities include mining consultation, exploration for the base and precious metals deposits, and evaluation, and assessment of the mine tailings. Geoexplorers is the owner of "6M-EX" technology.

- Developed (together with dr. Jan Krasoń) the innovative metal concentration and extraction technology „6M-EX” to recover all metals found in the complex ores, especially in the organic-rich black shales and flotation mine tailings.
- Greatly improved „6M-EX” technology by simplifying complicated processes applied to the precious metals recovery.
- Established an independent laboratory in the USA specializing in the concentration and recovery of precious metals.
- Researches the area of nanotechnology and materials, specifically regarding precious metals.
- Identified and analyzed ore samples for precious metals in the sedimentary rocks located in the western USA.
- Studied and analyzed KGHM's mine flotation tailings samples for precious metals.
- Developed many innovative techniques applied to the precious metals recovery from ore and mine tailings.

**2001-2011 - Amerpol Group** - New York, N.Y. - International real estate investment group. *Co-Founder*

- Coordinated real estate projects totaling \$260 M from the planning stages to their execution while allocating funds.
- Constructed complex financial models for the financial industry in the USA and Europe.

**1993-1995 - „Korol” - Polish American Joint Venture** - Poznań, Poland - *Co-Founder. Employment 80*

- Joint Venture between „GEM” Products Corp., USA and „Polsrebro”, Poznań, Poland
- The company produced jewelry for the domestic market.

**1989-2000 - P.Z. „GEM” Products Corp.** - Warsaw, Poland - *Founder, President & CEO. Employment 320.*

- Established and build the biggest private jewelry manufacturing company in Poland.
- First and only foreign enterprise to receive a license (no. 239/89) for jewelry production and sale without restrictions.
- First foreign enterprise in Poland (P.Z.) that invested over \$3.5 million in jewelry machines and equipment.
- First company to train young people, including disabled people, in western jewelry mass production techniques.
- Built a full-scale metallurgical laboratory for testing and refining precious metals from jewelry scrap.

**1989-1992 - Led the negotiations with the USSR and then the Russian government on a revitalizing their domestic jewelry industry**-initiated by Anatoly A. Sobchak (the Mayor of Saint Petersburg, Russia) and others.

- Presented a modernization plan for the Russian jewelry industry by using their resources and our expertise.
- Initiated a plan to target the U.S. jewelry market for Russian domestically mined diamonds and precious metals.

**1987-1989 - Led the negotiations with the Polish government on establishing a domestic jewelry industry**-initiated by prof. Zdzisław Sadowski (the Chairman of the Planning Commission of the Council of Ministers (Komisja Planowania przy Radzie Ministrów). Mieczysław Wilczek (Minister of Industry), and others.

- Negotiations involved establishing a jewelry industry in Poland using our proven expertise in the western production techniques, machinery, and thorough knowledge of the American and world jewelry markets.
- The first stage of this project involved the gradual processing portion of the precious metals (silver & gold) generated by Kombinat Górniczo Hutniczy Miedzi (KGHM) in Lower Silesia, SW Poland.
- The second stage involved the initial training and employment of few thousand people in Warsaw and Lower Silesia.
- The third stage involved the production and export/sale of fine jewelry and souvenirs on an industrial scale.

\* **Please note that even then, the communist government realized that selling highly processed jewelry products instead of raw materials would be a “win-win” situation for the government, KGHM, and the people.**



**1986-1989 - Negotiated with the government of Ghana on a jewelry project** - initiated by the President of Ghana, Jerry J. Rawlings, and former Chief of the defense Staff of Ghana, General Ashley-Lassen.

- The government of Ghana proposed establishing a jewelry industry utilizing domestic gold and diamond resources.
- Obtained an initial authorization from the government of Ghana to teach and employ up to 5,000 people.

**1984-1993 - P.Z. „Kortex”, Białystok, Poland - Founder and Owner. Employment 350**

- The company became a major private producer of medical and laboratory instruments, employing highly educated personnel.
- Became one of the major exporters of garments to the Federal Republic of Germany.

**1972-1984 - Korol Creations, Inc., New York, N.Y. USA - Co-Founder and VP. Employment 250.**

- Designed and mass-produced fine jewelry for the USA's largest department stores, catalog houses, diamond and precious stones dealers. Customers included: U.S. Military, Tiffany & Co., Cartier, Van Cleef & Arpels, Zales, Gordon's Jewelers, Fortunoff's, A. Jaffe, Helzberg Jewelers, etc.
- Trained young people in jewelry designing & production techniques who became leaders in the industry.

### LEADERSHIP ACCOMPLISHMENTS

**1993** - Founded and sponsored the first private jewelry school in Warsaw, investing over \$250,000.

**1973** - „Outstanding Citizen Award” from the Nassau County Police Dept. for saving passengers from a burning car.

**1987** - Led a team of the most prominent Polish foreign trade companies to Ghana for mining and jewelry joint venture.

**1969** - „The Polish American Youth Association of Long Island”, Hempstead, N.Y. USA - *Co-Founder and President*

- Organized massive turn-out of anti-communism rallies in front of the Polish and the Soviet Consulates and Permanent Missions to the United Nations in New York, N.Y.
- Organized and financed one of the biggest smuggling channels of thousands of anti-communist books and literature to communist-held Poland. Most of the materials were donated by the founder and first President of the Polish-American Medical Society „Medicus” - Dr. Jan Danek, the editor of Paris-based periodical, „Kultura” - Jerzy Gierdroyc and Polish journalist, writer, politician and patriot - Jan Nowak-Jeziorański.
- Organized monthly festivities, dances, and different events at the Polish National Club located in Hempstead, N.Y.

**1969** - The Polish American Congress (PAC), New York, N.Y. - *Member*

**1968** - The Polish-American Medical Society „Medicus”, New York, N.Y. - *Member*

- Designed, produced, and donated first gold medals awarded to prominent Polish and Polish-American individuals.
- The first gold medal was given to Polish Cardinal Stefan Wyszyński. Other prominent recipients were: Dr. Zbigniew Brzeziński, Cardinal Józef Glemp, Prof. Jan Kakot, M.D., Prof. Hillary Koprowski, M.D., Polish Cardinal Franciszek Macharski, General Stanislaw Maczek, Prof. Witold Nielubowicz, M.D., and Prof. Andrew Schally, M.D.
- Organized and financed the shipment of medicine and medical equipment to communist Poland during Martial Law.

**1968 - 1984** - Organized and financed the shipment of different gifts/donations including, cloths, medications, toys, food, etc. from the Polish Americans to individuals and institutions in the communist-held Poland.

**1967** - The Polish American Dance group „Hejnal”, Hempstead, N.Y. - *Co-Founder, Member*

**1966** - The Polish American Soccer Club „Biały Orzeł”, Hempstead, N.Y. - *Co-Founder, Member*

### EDUCATION & TRAINING

**1968-1971 - Hofstra University** Hempstead, N.Y. USA - *Business & Finance, Bachelor of Business Administration (BBA)*

**1963-1971 - H & P Korol & Co., Inc., New York, N.Y. USA - Master Jeweler**

- Attained extensive training under the direct supervision of world-famous jewelers - Henryk Korol, Piotr Korol, and others, in all phases of jewelry manufacturing processes from designing, model making, casting, assembly, stone setting, polishing, pricing, and marketing.
- Became an expert jeweler, metallurgist, and gemologist through comprehensive hands-on practical experience in dealing with gold, platinum, diamonds, precious and semi-precious stones.

**LANGUAGES:** Fluent in English and Polish. Advanced knowledge of Russian.

**PUBLICATIONS:** Authored and co-authored over 80 detailed reports, analyses and financial proposals for investors in the USA and Europe, and over 120 papers, articles, tables and posters regarding mining and jewelry industry.