Beatty, Nevada is Home To The United States' First True Eco Sustainable Mineral Processing Plant

The world's first dry concentration plant utilizing revolutionary polymer graphene oriented electrostatic separation technology invented by James Gim

LAS VEGAS, NEVADA, UNITED STATES, June 19, 2021 /EINPresswire.com/ -- The world's first dry concentration plant utilizing revolutionary polymer graphene oriented electrostatic separation technology invented by James Gim, CEO Avimetal Inc, was build at 54 acres of property at Beatty purchased by Coronet Metals US Inc., a Nevada corporation. Beatty City is an unincorporated town in Nye County, Nevada, that was founded in October 1904 and is situated at the intersection of Highway 95 and State Route 374. Beatty has a wide array of land, water, and scenic natural resources. Its natural resources are very important not just in terms of economics, aesthetics, and enjoyment, but also in terms of land use monitoring and management. Land, water, and attractive natural resources abound in Beatty. The Amargosa River passes through the populous area of town, including beautiful riparian and aquatic ecosystems. Death Valley National Park, Off-roading, bird watching, hiking, ghost town exploration, camping, photography, filmmaking, star gazing, geocaching, and so on, is on a short drive from Beatty. Furthermore, There is a 54 acre empty property tract with access near Beatty,

NV. It is bordered by beautiful mountain ranges that give picturesque vistas and routes for hiking, motor sports, horseback riding, and other activities. The property validated to BLM territory, giving you plenty of opportunities to explore. It's 90 minutes from Las Vegas, 20 minutes from Death Valley National Park, half a mile from hot springs, and a few miles from Beatty's historic town.

Avimetal’s Eco-Sustainability Technology:

The Avimetal company is on the cutting edge of dry concentration, milling, and non-cyanide leaching processes that do not require wastewater. Avimetal’s environmentally-friendly mineral processing technologies will bring about a revolution in the mining industry worldwide, in which all processes are dependent upon using tons of water and toxic chemicals. Existing mining process involve the use of gravity concentration by water and froth floatation, which requires the use of a high amount of water and chemicals. Avimetal is a subsidiary of Coronet Metals US Inc., based in the United States. For the past ten years, Avimetal has been conducting research and development for the treatment of mining effluent and slags, and the final results represent various eco sustainable effluent and slags processes that not only clean, but also work to recover commodity and worthwhile base metal.

Using Avimetal's technology, by Coronet Metals US will clean up tailings and slags that have accumulated around this location, and then continue to expand the underground mine. The facility was built by Avimetal, without the use of water or chemicals, and consisted of crushing, milling, drying, and electrostatic concentration. Picchu Rio Gold Inc. in Quilabamba, Peru, was the first to commercialize Avimetal's dry concentration process. The mining permit in Peru has been suspended since 2012 owing to mercury and cyanide poisoning of water downstream of the Amazon River. Picchu Rio Gold was granted a processing permit for the first time in 2018 in 2018. The Peruvian government has made the EPA rule for approving Avimetal's dry concentration technique legitimate.

Avimetal's system replaces a ball mill or Raymond mill with a micronization milling system, which saves on electrical power, plant size, and smaller particles of up to 400 to 600 mesh. Because of the advantages gained from being able to mill finer and better particle release for increased precious metals recovery, the introduction of ultra-fine micronization milling has the potential to revolutionize the mineral processing sector. Since most gold particles are exceedingly minute and invisible (commonly referred to as a "micron silica cluster," because a micron size of small gold is contained by silica), fine particles are crucial in gold ore mineral processing. The smaller the particle, the greater the amount of gold recovered. Smashing and milling are the first steps in

this process in the early stages of the mining sector. Ultra-fine micronization milling is a patented, novel, and marketed particle size reduction technology that reduces solids capable of fracturing into a particle-sized powder in seconds. It can take the position of traditional ball mills, impact mills, hammer mills, Raymond mills, tower mills, and other mills.

A cyclone airstream, created by the mechanical impact of a spinning impeller, as well as an intensive vortex airstreams and high frequency air pressure oscillation, are generated at the backside of the revolving rotor and the groove slopes, enable an ultra-fine raptor to achieve this. The material is transported into the mill by the airstream. In the input spiral chamber, the airstream containing this material is spiraled and then equally transferred into the milling chamber.

The principle of triboelectricity underpins Avimetal's dry concentration. Electrostatic concentration has been employed in the mining sector for a long time, but its use has been restricted due to issues such as unit price, processing capacity, and the inability to handle microscopic particles. Electrostatic separators are classified as gravity or electrostatic attraction. They both work in similar ways, but the forces that are delivered to the particles differ. High tension rollers and electrostatic separators are both electrodynamic separators. A corona discharge charges particles in high tension rollers, and the particles are then charged as they travel on a drum. With centripetal acceleration, the conducting particles lose their charge to the drum and are then expelled from the drum. Passing a stream of particles past a charged anode is how electrostatic plate separators work. Due to their induced attraction to the anode, the conductors lose electrons to the plate and are drawn away from the other particles. These separators are designed to separate particles with a diameter of 75 to 250 microns, but they are ineffective in mineral separation due to the ore's micron size and a capacity of less than a hundred kilos per hour. MIT created a belt-type separator that works on micron-sized particles and has a high separation capacity – 5 tons per hour – but the unit cost is in the millions of dollars. Avimetal's electrostatic separator has four stages of graphene-oriented anode plates and cathode pairs, is capable of treating 5 tons per hour, and can separate micron size by utilizing graphite's super conductivity of electrons at low prices. It also has a Full Know Down (FKD) kit idea, which allows a miner to construct the unit in a few hours and save money on logistics by moving at a 20-to-1 volume ratio.

The electrostatic separator is a device that uses the principle of corona discharge to separate particles by mass in a low-energy charged beam. It operates by placing two plates close together and applying a high voltage. The ionized particles are separated using this high voltage. Electrostatic separation is a method of separating crushed material particles using electrostatic charges. This method can aid in the extraction of precious materials from ore.
Electrostatic charges are commonly utilized to attract – or repel – electrically charged materials. One of the most important pieces of equipment in the electricity mineral separation process is the Quadrant Roller Electrical Sorter. Because most precious metal forms occur in tiny micron sizes and have a low separation capacity, the roller type has a restriction for separating micron size. MIT has developed a tribo-electrostatic belt separator that has proven to be capable of

processing small particles in huge quantities. As a result, we've created low-cost electrostatic separators that combine the advantages of roller and belt superiors.

Our plate type is precisely controlled, and the system includes eight pairs of plates. Compact size, low sales price, ability to separate micron size, huge production capacity, and low power usage are all advantages of this technology over competitors. Depending on the properties of the ore contents, valuable and precious metals from dry concentrated materials can be refined further using cold plasma, hot plasma gasification, or a cyclone electrowinning system, followed by NaCl (salt water) hypochlorite leaching.

System for Cold Plasma

Plasma is a novel – and potentially transformative – technology that employs an advanced state of matter known as "plasma," but it's vital to understand that "cold plasma" is a distinct sort of plasma. Plasma, commonly known as the "fourth state of matter," has the properties of a gas but also conducts electricity like a wire due to its ionization. Plasmas are critical in a variety of scientific and industrial applications. Richard Woodford and James Gim created this one-of-a-kind method, which will be marketed for metallurgical refinement. When a DC pulsed electric current is supplied to the hydrogen molecules in the gas, it ionizes them, resulting in the production of various radicals. In such a technique, hydrogen's refining ability is improved. When radicals reach the melt's surface, they react with impurities to produce volatile chemicals such NH3, H2S, and PH3. The compounds will be transported away by fluent gas since they are insoluble in the melts. Finally, the metal's impurity elements are eliminated. A cold plasma device containing a reactor, a positive electrode, a negative electrode, a membrane, and an agitator is described. The conductor is set up to generate cold plasma with a temperature of 65 to 120 degrees Fahrenheit. The membrane and electrodes are our own inventions, and the electrolyte is a NaCl including our own compounds. By altering the PH level, metals will be recovered.

Plasma System (Hot)

The mining industry requires more cost-effective and efficient head ore and slag concentration and precious metals refining technologies, with the Break Even Point (BEP) of gold ore, slag, and other material being at least 0.2 ounces per ton of gold. Below 0.2 OPT and above 0.1 OPT, many million tons of material are available in the Southwestern region. In the last decade, plasma gasification technology has been shown to aid in the recovery of value-added metals from slag or ore. Plasma gasification is a method that uses plasma to transform organic materials into synthetic gas, power, and slag. To ionize gas and catalyze organic materials into synthetic gas and solid waste, a plasma torch powered by an electric arc is utilized. A plasma plant, on the other hand, is very expensive and has a restricted output capacity. In actuality, the order to installation period is a year to two years, and there is a significant quantity of area necessary.

Avimetal has created an economical, low-cost RF Plasma Gasification System ranging in size from 120 KW to 960 KW, which will be accessible to install in parallel and improve capacity by

combining several feeds and torches into one system. It's a plug-in system and play turnkey solution with a modular concept.

Electrowinning using a Cyclone

As a straightforward, single-step method for treating these solutions and overcoming the requirement to return the confined metal to the process, cyclone electrowinning technology provides a number of important advantages over conventional electrowinning. The cyclone electrowinning process has a number of advantages, including the ability to operate at much higher current densities than traditional tanks. This results in a significant increase in output rate per square meter of cathode, as well as a reduction in capital expenses. The cyclone electrowinning circuit is incredibly basic and has few moving elements from an engineering standpoint. It has a modular design that allows for easy installation and expansion as well as relocation. The working windows in which the technology maintains high current efficiency and product quality are extremely vast, with one of the technique's fundamental advantages being its ability to electrowin metals at very low concentrations efficiently. The cell is completely enclosed and does not cause an acid mist problem, resulting in significant capital cost reductions in construction and infrastructure.
No additives are needed to preserve good product quality, and electrowinning is typically done at room temperature. In comparison to a conventional cell, the cyclone electrowinning cell is more forgiving of impurities in a solution. Its strong mass transport characteristics help to maximize target metal recovery while reducing co-plating of other metals. Because of the confined form of the cell and the lack of a "water line," it has a much higher tolerance for entrained organics and chlorides. The cell does not have a lead-based anode in its conventional form, removing a potential source of product contamination.

The electrowinning circuit has a low capital cost, especially when compared to the magnitude of the operation. Only one cathode (Ti starting sheet) and one anode (our patented) are used in a single cyclone electrowinning cell (Graphene Coated Ti composite). The certified electrolyte is poured into the cyclone electrowinning cell at high speed from the bottom of our patented water turbine. While the copper cathode deposits on the Ti cathode, the Cu2+ level in electrolytes will decrease. The oxygen will form a negative anode nearby, which will then discharge from the cell. After that, it's collected and treated in a big acid mist system. Per 23-hour cycle, the finished copper cathode deposits roughly 70-75kg.

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