



cascaderocopper

(TSXV: CCD)

**CASCADERO INVESTOR PRESENTATION  
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**TARON: DISCOVERY TO DEVELOPMENT**



**VIEW OF TARON OUTCROP LOOKING SOUTH EAST**

Cascadero Copper is a TSX Venture Exchange listed explorer and resource development Company that trades under the ticker symbol “CCD”. The Company is managed by Bill McWilliam and Dave Trueman. In 2004, a Cascadero prospector Ron Bilquist took rock samples from a large out crop

in NW Argentina. The assays returned highly anomalous values of Cesium and several other elements.

So began the journey, to determine if a Cesium resource was present and large enough to develop into a bulk mineable open pit mine. The first question was can the Cesium mineral be extracted from the Taron rocks with a simple metallurgical approach?

Between 2004 and 2009, Cascadero completed a development program of regional sampling, excavator trenching, initial metallurgical tests and diamond drilling. Initial metallurgy was done by SGS Lakeview Ontario who established the fact that that the run-of-mine Taron mineralized material could be acid leached with good recovery and kinetics. The regional sampling program indicated that the Taron showing may represent the largest accumulation of Cesium known to exist. The trenching program succeeded in establishing that the Cesium mineralization was present over an area of approximately >50 sq kilometres and appeared to be laterally continuous between trenches. The Company then in drilled seven core holes over a 1.1 kilometre section and the mineralization extended to depth in each drill hole. At this point the Company believed they had a major mineral discovery in place.. Due to lack of financing the property was dormant from the end of 2009 to the middle of 2014. The Company managed to borrow some money and after a critical review of the Argentine property portfolio it was decided that Taron was the most and best property in the portfolio and we decided to finish the metallurgical work started in 2006. Cascadero partnered with UBC and several important developments were made. Taron was a pure geochemical discovery that, due to an unexpected change in in the global Cesium industry in 2012, the Taron discovery took on a new significance.

Cesium (chemical symbol Cs) is one of the world's rarest metals (crustal abundances <4ppm), with a wide and growing range of industrial applications. It is liquid at room temperature so unlike gold or platinum a jewelry application is not possible.

There rae two miners and processors of Cesium compounds and minerals that have dominated the global Cesium industry for the past ~25 years, and

both mines appear to have geological complications that could end the supply of Cesium to the market.

The Taron Cesium prospect is an Argentine property controlled and financed by a 70/30 Cascadero and Regberg joint venture. The summary of all the exploration, metallurgical work and other data suggests that Taron could become the lowest cost supplier of Cesium Hydroxide to the Cesium market. Cesium Hydroxide is the substrate for all other Cesium compounds and a large diversified market place already exists. Cascadero is focused on producing Cesium Hydroxide. A 2015 metallurgical study at UBC proved that Taron can produce Cesium Hydroxide. The assays of the composite used in the UBC metallurgical study demonstrated a head grade of 0.47% Cesium and an overall recovery of 91% Cesium. The head grade is far below the grade currently being mined and processed. Despite Taron's low grade we took a broader view and we believed that an open pit mine would provide far better economics than the Bernic Lake underground deposit and the superior metallurgy could compensate for the energy intensive processing plant used by Cabot.

Since Taron may be the only Cesium deposit to fill the supply gap, Cascadero does not have the usual industrial minerals marketing issues: too many competitors fighting for a piece of the market.

The Cesium story is basically one of simple supply and demand. The demand for Cesium products with demand growing at a compound rate between 6% and 8% per annum for a decade as new applications are discovered.

On the supply side, the world's two dominant mines and the principal sources of supply of Cesium to the global market are effectively depleted or facing uncertain futures. Supply from Cabot Corp has been restricted to certain clients so overall supply is already decreasing. Without a new large-scale resource the global industry will struggle to secure the raw materials needed for growth or be subject to a significantly increased cost structure. This could be a reality sooner than later.

Cesium is a soft silvery rare alkali metal with chemical properties similar to the other alkaline metals sodium, potassium, rubidium and lithium. It is liquid at room temperature. The principal and largest volume use of Cesium is in a compound called Cesium Formate, which has the viscosity of water but is 2.2 times denser. For this reason, it is an ideal specialty fluid used in oil and gas drilling and completion to lubricate drill bits, bring rock cuttings to the surface, to control and inhibit corrosion and to maintain pressure on the formation during drilling the well. It is approved by environmental authorities as safe to use in ocean and land applications as it is the least toxic to the environment, especially the sea floor and its inhabitants.

Cesium Formate brines help oil and gas companies drill up to 74% faster than competing brines, polymers and muds, it is environmentally friendlier as well as being recyclable. Cesium Formate that is returned from a drilling job can be mostly recycled, reconstituted and reused. By comparison, when using other drilling fluids such as barite muds, diesel fuel or polymers, the rock cuttings must be transported ashore and cleaned or buried, which adds time and money to the operation. In addition the majority of drilling products cannot be recycled. Cesium Formate is water soluble, thus allowing the chips to be washed onboard the rig and deposited back into the ocean.

Cesium compounds are also used as catalysts for accelerating or moderating other chemical processes such as the manufacture of plastics and coatings. Demand has been growing for Cesium compounds used as reagents in the plastics industry and certain cesium compounds increase the life and power of alkaline batteries. It plays an important role in assisting the catalytic separation of crude oil into many different hydrocarbon products.

Fission by-products such as the isotopes Cesium<sup>131</sup> and Cesium<sup>137</sup> are increasingly used to treat various types of cancer. Cesium is not naturally radioactive but it can acquire certain radioactive properties as it used as a very effective heat transfer fluid used to cool the operation of nuclear reactors. There are many opportunities to adapt the properties of Cesium Formate in numerous heat transfer applications.

Cesium also has a range of applications in the production of electricity, and in electronics, as well as chemistry. For example, Cesium carbonate is used in the alkylation of organic compounds and in energy conversion devices such as fuel cells, magneto-hydrodynamic generators, and polymer solar cells. It is widely used in the field of DNA applications.

Cabot Corporations' Tanco (Tantalum-Lithium-Cesium) mine is an underground deposit located beneath Bernic Lake in Manitoba. Until recently it has supplied ~80% of world demand for Cesium compounds and has essentially been a monopoly producer and supplier of Cesium Formate since 1994. Cabot does not sell the Cesium Formate as it employs a lease style revenue model. This model makes it virtually impossible to determine how many barrels of Cesium brine are used per year. Estimates of Tanco's formate production vary but production in 1997 was reported at 500 barrels a month and expanded in 1999 to 700 barrels per month. No cost of production or revenue is available as Tanco is a private Canadian company that is not required to publish its business information in the public domain.

Unfortunately in 2010, the Tanco Mine suffered a "fall of ground" which was followed in 2013 by a second and larger fall of ground. This is due to the fact that the crown pillar of the mine is undergoing compression, causing unstable ground conditions and allowing lake water to enter the mine. These occurrences have curtailed pollucite production and sterilized parts of the ore bodies. Pollucite is the principal ore mineral of Cesium.

The Manitoba Department of Mines investigated the cause of the ground falls and determined that the mine was unsafe. It requested that Cabot Corporation develop a mitigation plan. The mitigation plan that Cabot submitted was not satisfactory as it required pumping a large volume of organic rich water into the Bernic River, which is connected to the Winnipeg fresh water supply. Subsequently, the Department of Mines ordered the mine closed. It is now on care and maintenance, and its future ability to provide Cesium to the global market is unknown. Current production from Bernic Lake is from above ground storage and waste piles.

The second largest global source of Cesium was the Bikita Mine in Zimbabwe. Bikita was discovered 65 years ago and it has been a producer of lithium minerals and ores and some pollucite for over 50 years. Currently pollucite from Bikita is being produced from above ground stockpiles and waste dumps. The raw material pollucite is shipped from Bikita to Germany and China for processing. Anecdotal evidence suggests there are only two-to-three years of above ground resources of pollucite in inventory. It is believed that the pollucite zone in the Bikita pegmatite is exhausted. So far there are no new discoveries of pollucite and no new known mineral contains Cesium, excepting Taron.

And, even if there were legitimate pegmatite exploration targets with potential to host pollucite zones it may take an enormous exploration effort that could require more than ten-years to produce a discovery and many more years to establish production. All of which will cost many millions of dollars. Taron may be two-to-three years to production of Cesium Hydroxide.

Historically, Cesium has been extracted from the mineral pollucite and to a lesser amount from lepidolite, as is the case at Tanco and Bikita. Marginal production of pollucite coming from China is hosted in narrow veins and dykes and volume of supply is constrained. The Chinese deposits are expensive to mine and the processing technology is also expensive. There are over three hundred Lithium-Tantalum-Cesium pegmatite's known and catalogued and several have been drilled. So far only four deposits were large enough and high enough in grade to support the expense of building a mine that could supply the global Cesium market. Two of these are now collector sites for Cesium and other rock specimens.

There are industry experts that believe pollucite is the only mineral that is the only source of Cesium. As we have recently proved this belief is not correct as Mother Nature has a way of surprising the geological community.

In contrast, Cascadero's Taron deposit hosts a newly recognized Cesium mineral, formed from epithermal fluids circulating in a shallow crustal environment, forming a variety of minerals, colloids, glasses and clays.

These mineral assemblages have important implications for processing the Taron ores and their process patentability.

In 2015, Cascadero partnered with the University of British Columbia to demonstrate the viability of producing Cesium Hydroxide and Cesium Formate from drill core from the Taron deposit. The work was completed successfully and the process involved extracting the Cesium and producing an apparent economically viable compound has now been taken to patent. Run-of-mine Taron Cesium mineralized rocks are leached by sulphuric acid and with other off-the-shelf reagents provided proof of concept that an inexpensive process to recover Cesium and make its compounds is viable.

There are two clear segments for the Cesium market, the most important one being drilling and completions fluids, which consume ~75% of global supply. The second segment, which consists of fine chemicals and pharmaceuticals are estimated at ~25% of the market. This segment is expected to consume ~750 tonnes of Cesium compounds annually. The Cesium pharmaceutical compounds have much higher margins than Cesium Formate but they all require Cesium Hydroxide as the starting point.

Detailed information on production, mining and processing costs and volume and cost of Cesium compounds is difficult to obtain because Cabot Corporation, has had a virtual monopoly of the product supply chain. However, accumulated data from the USGS, Cascadero's research, and other literature suggests that annual worldwide demand may be in excess of 3,000 tonnes per year of equivalent Cesium Formate, which may, if sold and not leased could be >US\$ 150 million per year.

Quoted prices for compounds such as Cesium Carbonate, Cesium Hydroxide, Cesium Chloride, Cesium Nitrate, Cesium Acetate are readily available but are quoted in small quantities so are not reliable for larger or bulk quantities. Cascadero estimates the annual global market value of these small quantity specialty products at >US\$50 million and growing.

Taron has been subject to over 8,600 metres of hand and excavator trenching, 907 metres of HQ drilling in seven widely spaced holes, 390 regional rock outcrop samples and assays and all data indicate the presence

of a large Cesium mineralized sediment hosted polymetallic epithermal system.

We have confidence that the data and the pattern of trenching, sampling and drilling give a realistic three dimensional picture of the showing that supports our view that, when further drill testing is conducted, Taron will host a large volume of Cesium and a conjectural resource at this stage of deposit knowledge, we believe a volume of 600,000,000 kilograms of Cesium (Cs) may be supported. This estimate is based on geological modeling, wireframe analysis and specific gravity analysis, plus all the assays.

By comparison, Tanco's published preproduction resources of 400,000 tonnes containing approximately 90,000,000 kilograms of (CsO), which is ~96% Cesium. The Tanco tonnage and grade figures have since been considerably reduced as a result of further production and in 2008 (nine years ago) the Manitoba Government stated there were ten-years of reserves left. Since then, the Tanco resource has been compromised by rock falls and part of the resource has been sterilized from mining. The Tanco ore bodies have been mined exclusively for pollucite since 1996, which activity would clearly further decrease its reserve base.

The Taron Cesium mineralization is close to the surface and variably outcrops over a 70 square kilometre area. Preparations are currently underway to complete a 29 diamond drillhole program consisting of 2,175 metres. Cascadero expects the drill program to provide evidence that a Cesium resource is present that can support a mine for at least ten years.

Management believes the Company is positioned very uniquely and favorably in the Cesium competitive arena.

Firstly, buyers of Cesium compounds have very limited options to acquire product due to supply restrictions as demand consumes current finished inventory of Cesium compounds and above ground stockpiles of pollucite.

Secondly, the current suppliers of Cesium face an uncertain future and it seems likely that global production demands cannot be achieved without a new large-scale supply.

Thirdly, due to its high specific gravity there is no substitute for Cesium in its current applications, with the added issue of new applications being discovered as research and technologies advance.

Finally, there has been nominal exploration by global industry partners who have to date been unable to find a substitute supply of pollucite at the grade and volume of current supply sources. Large mineral deposits of rare metals are extremely rare and will take years to discover and develop making entry into the market virtually impossible at this time putting Taron in first position for new supply.

Other opportunities exist for the Company, including the possibility that it or the property could become an acquisition target. There are five deep-water drilling companies who use Cesium Formate in their operations and which have the capability to vertically integrate deposits that make their businesses more valuable and less risky. Cascadero has entered into confidentiality agreements with interested potential partners.

In addition to Taron, the Company has 17 other early stage properties ranging from high-and-low-sulphidation Au-Ag showings to sediment hosted showings that demonstrate favorable geochemistry within large-scale areas of alteration. The Company has Cu-Au-Mo porphyry showings among other styles of gold, copper and silver targets in Argentina.

The Santa Rosa showing has produced many high-grade gold samples with lead, zinc, silver and stibnite enrichment. We are currently mapping and sampling this outstanding property that has demonstrated numerous gold assays from surface veins and outcropping breccias. The Company owns the former producing Ochaqui manganese (Mn) mine. Manganese is a low-margin commodity that is finding new higher margin applications in the marketplace. These properties are very prospective in their own right, but still early in the development pipeline. These properties are all potential joint venture or acquisition opportunities as Cascadero continues their development.

## **Management**

### **Bill McWilliam (CEO)**

Mr. McWilliam was a financial and securities analyst in the 1980s – 1990s. He was the Senior Investment officer of a well known Montreal based trust company and was responsible for client accounts from Tahsis to Winnipeg. He has managed and financed exploration programs for various companies for almost 30-years. Mr. McWilliam is the founder of Cascadero Copper, which was incorporated in 2003. He has been an integral to the Company's operations for 14 years.

### **David Trueman Ph.D P. Geo**

#### **(VP Geology)**

Dr. Trueman has been involved with rare metal deposits since the late 1970s when he joined Tantalum Mining Company of Canada (TANCO), which, at that time, was producing some ~70% of the world's Tantalum. He has worked on rare metal deposits throughout the world.

## **Brief Summary**

Cesium deposits, especially large mineable ones, are rare in nature and replacing mined resources is problematic for the industry as a whole.

The investment questions are: Why Cesium? How often are you presented with an investment opportunity where the principal and only suppliers are out of supply, demand is robust, and you have discovered the only other source of supply known? This is the Taron Cesium story at this time and we are very fortunate to have found the deposit.

Management believes it is time to develop the property as far as we can take it to become a producing mine.

The current plan includes the following activity:

1. Complete a 29 HQ core hole program (2,175m) to professional standards that enables the Company to provide a 43-101 style technical report that gives the Property and the Company a valuation metric.

2. Complete the second stage of metallurgical work whereby a Cesium Concentrate will be created.
3. Provide a project evaluation analysis that will give the Company guidelines into the structure and pricing of the Cesium Hydroxide segment of the global Cesium industry.
4. Prepare the plans and the engineering for an online pilot plant to process 3,000 tonnes of Taron mineralization per day.
5. Develop a marketing, logistics and delivery plan.

On behalf of the Cascadero Copper board and its advisory board,  
I thank you for your interest

Bill McWilliam, President/CEO