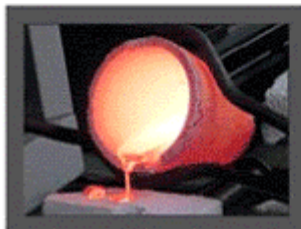
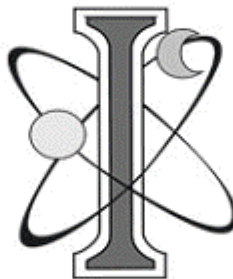


# ITRONICS INC.

A Cleantech GOLD'n GRO Fertilizer, Silver, and Mineral Producer™

*Itronics Technologies Maximize Sustainability*



ITRONICS CLEANTECH MATERIALS BUSINESS PROFILE | 2020

AWARD WINNING CLEAN TECHNOLOGY



## Table of Contents

Who we are .....	2
What we do .....	3
Nevada Grown, Internationally Recognized.....	4
Notable Industry Awards.....	4
Itronics Cleantech Materials Growth Plan.....	5
GOLD'n GRO Multi-Nutrient Liquid Fertilizers.....	5
Silver Bullion Production .....	6
Printed Circuit Board Processing.....	7
Pure Metal Production.....	7
Rock Kleen Tailings Processing .....	7
Silver/Gold Mine Tailings .....	8
Copper Mine Tailings .....	9
Auric Gold and Minerals Fulstone Polymetallic Gold Project.....	10
Market Estimates.....	12
GOLD'n GRO Multi-Nutrient Fertilizer Sales.....	12
Printed Circuit Board Refining.....	12
Rock Kleen Tailings Processing.....	13
Gold/Silver Mine Tailings.....	13
Copper Mine Tailings.....	14
Future Portfolio Technology Applications.....	14
Mineral Nutrient Recovery from Battery Paste .....	14
Spent Pot Liner from Aluminum .....	15
Air Pollution Control Dust .....	16
Contact .....	18

## WHO WE ARE

Itronics Inc. is a Reno, Nevada based emerging Cleantech Materials Growth Company that uses proprietary multi-nutrient fertilizer manufacturing technologies to produce GOLD'n GRO Multi-Nutrient Fertilizers, and a portfolio of breakthrough Zero Waste Energy Saving Technologies to recover fertilizer raw materials, silver bullion, and silver-bearing glass from waste streams that contain silver, gold, copper, zinc, tin, and other metals. The Company's portfolio technologies maximize the recovery and uses of fertilizer materials, metals, and



minerals and by doing this maximize sustainability. The Company's goal is to achieve profitable clean technology driven organic growth in GOLD'n GRO Multi-Nutrient Fertilizers, silver, zinc, and minerals.

Itronics Inc. operates as a holding company with two wholly owned subsidiaries, Itronics Metallurgical, Inc. and Whitney & Whitney, Inc.

Itronics Metallurgical, Inc. manufactures GOLD'n GRO Multi-Nutrient Fertilizers, produces silver bullion and silver bearing glass, and does the company's R&D. Whitney & Whitney, Inc. provides technical and administrative services for the three companies. The operating property assets are owned by Itronics Metallurgical, Inc. The Company also controls, through its partially owned subsidiary, Auric Gold & Minerals, Inc., a 2,800 acre gold, silver, copper, and zinc mineral property (the Auric Fulstone Polymetallic Gold Project) in the Yerington Copper Mining District in western Nevada.

Itronics is operating a manufacturing facility with a 35,000 square foot building on 3.5 acres of land in Reno, Nevada. In June 2019, the Company acquired a 48-acre, 60,000 square feet manufacturing facility north of Yerington, NV for development as a technology campus. The Itronics Cleantech Materials Campus is zoned for fertilizer manufacturing, chemical manufacturing, and foundry operations. It has four dry product silos and four liquid product tanks with a total volumetric capacity of 300,000 gallons and is adjacent to a rail siding. The site is also serviced by water, electricity and natural gas and is strategically located within 15 miles of the Auric Fulstone Project. This property has a clean phase II environmental report and does not have any legacy environmental issues.

The GOLD'n GRO Multi-Nutrient Fertilizer division dates to 1988 when the Company developed the GOLD'n GRO secondary and micronutrient fertilizer lines using spent photographic liquids as a raw material. The fertilizer is sold and distributed through Nutrien Ag Solutions' Loveland Products brand of fertilizers. Nutrien is the world's largest producer and distributor of fertilizer with over \$25 billion in annual sales. Itronics signed an exclusive manufacturing and distribution licensing agreement with Nutrien in 1998. The majority of Itronics current revenues are produced by selling GOLD'n GRO Multi-Nutrient Liquid Fertilizers wholesale to Nutrien Ag Solutions, who then sells it to its farm customers through its network of Ag Retail Stores.





Itronics Metallurgical, Inc. revenues are currently derived through the sale of 12 different multi-nutrient fertilizer formulations to its distributor and the sale of silver bearing bullion and silver bearing glass to finish refining and copper smelting.

Whitney & Whitney, Inc. provides administrative services to Itronics Inc. and its subsidiaries, manages research and development for the multi-nutrient fertilizer division, and provides administrative and technical services to Auric Gold & Minerals for its Auric Fulstone Polymetallic Gold Project (collectively “Auric Fulstone”). Whitney & Whitney, Inc. also own a 70 percent interest in Auric Fulstone. Historically Whitney & Whitney, Inc. contributes a small percentage of overall Company revenue. New product development is supported by Whitney & Whitney, Inc. Itronics is in discussion with companies that have expressed interest in providing funding for process development and if successful, project management will be provided by this division.



## WHAT WE DO

We convert waste products into 100% salable products, with zero waste, while saving energy.

This is what Itronics does.

This is the Power of Zero.

### Itronics Cleantech Materials has three main business lines:

1. GOLD'n GRO Multi-Nutrient Fertilizers
2. Silver Bullion Production
3. Rock Kleen Tailings Processing

All three business lines are interlinked utilizing the Itronics Zero Waste Energy Saving Portfolio Technologies. Itronics “Cleantech Materials” processes waste materials and recovers beneficial elements which Itronics Metallurgical, Inc. uses in its manufacturing processes. Itronics then converts residual materials to salable products.

Itronics’ focus is on sustainable agriculture and mineral development. The Company’s mineral development occurs in 3 broad areas; 1) mineral nutrient technologies that are focused on enhancing agricultural production, 2) mineral recovery technologies using consumer and manufacturing by-products as source materials, and 3) mineral extraction technology focused on previously processed ore.

The Company’s Zero Waste Energy Saving approach uses proprietary hydrometallurgical and pyrometallurgical processes that combine wet chemistry and pyrometallurgy to generate marketable products from everything they process, thereby eliminating the need for disposal into a landfill. These technologies also save energy by using the heat content in the waste products or process mine tailings where the energy to mine and crush has already been used.

## NEVADA GROWN; INTERNATIONALLY RECOGNIZED

Itronics is Nevada grown and internationally recognized for its award winning clean materials technology. To date, Itronics has been recognized by organizations such as Chemical Engineering Magazine (2001 Kirkpatrick Award; Top 5 Finalist), EDAWN, NCET, CAAR, IchemE, The Green Organization, Nevada Energy, and the State of Nevada.



With the receipt of these coveted industry awards, Itronics has gained international recognition for developing its zero-waste clean materials technology and has positioned itself strongly for future growth. In 2001 the company's accomplishments set the stage by earning them a spot as one of five finalists for the Kirkpatrick Chemical Engineering Award, the most prestigious worldwide award in chemical engineering technologies. The Kirkpatrick Chemical Engineering Achievement Award recognizes and honors the most noteworthy chemical-engineering technology commercialized, anywhere in the world. Chemical Engineering magazine has awarded this biennial prize continuously since 1933.

### - NOTABLE INDUSTRY AWARDS

- 2019 - Small Company Sustainability Leadership Award; EDAWN
- 2015 - Existing Industry Award; Manufacturing Excellence Award; EDAWN
- 2012 - Medium Entrepreneurial Technology Company of the Year; NCET Technology Awards
- 2008 - Green Company of the Year; Nevada's Center for Entrepreneurship and Technology
- 2007 - Dr. John Whitney, Northern Nevada Entrepreneur of the Year; Agriculture/Environment
- 2006 - International Green Hero; Green Organization, London, England
- 2005 - GOLD'n GRO, Top 10 New Tech; best of agricultural innovation; CAAR
- 2005 - USA Gold; International Green Apple Environmental Awards, London, England
- 2005 - Second place; Worldwide Environmental Awards, London, England (IchemE)
- 2001 - Top 5 Finalist; Kirkpatrick Chemical Engineering Award
- 2000 - Dr. John Whitney; Silver Star Award- Nevada's Truckee Meadows quality of life
- 2000 - Dr. John Whitney; Nevada's Inventor of the year



## ITRONICS CLEANTECH MATERIALS GROWTH PLAN

In January 2020, the Company released its growth forecast and 10-year business plan that is designed to integrate the Itronics developed Zero Waste Energy Saving Portfolio Technologies into a unified operation with three business lines. Annual revenues for Itronics combined business lines potentially exceed \$113 million by 2025. Each business line has potential for sustained long-term growth.



**Itronics Zero Waste Energy Saving Technologies research and development has made possible the three inter-linked business lines that:**

1. Take existing waste materials and produce GOLD'n GRO Multi-Nutrient Fertilizers
2. Recover precious and base metals producing silver bullion and silver bearing glass
3. Cleans tailings, recovers residual metals for refining/sale, produce industrial minerals

Significant growth is planned over the next five (5) years that will transform Itronics into a major supplier of multi-nutrient fertilizers; the largest printed circuit board refiner in the western U.S. producing silver and other metals; and an industrial minerals producer. The second five (5) years of the 10-year business plan is based upon continuous operations. All plant design is being completed with anticipation of further growth and expansion which will occur as fertilizer sales expand from regional to national and international. Utilization of the “Cleantech Materials” technologies developed by Itronics in three integrated business lines creates a solid foundation for long term profitable growth based on material and energy cost savings realized by utilizing waste materials as feed streams.

## GOLD'N GRO MULTI-NUTRIENT LIQUID FERTILIZERS

Itronics' history of innovation goes back to the 1980s, when Dr. John Whitney, President and Director of Itronics Inc. was asked to help solve the issue of toxic silver-bearing photographic waste being discharged into the Truckee River and threatening the native trout and salmon population. Dr. Whitney developed a technology that extracted the toxic silver and was able to recapture the valuable silver metal into silver bullion. The “zero waste” concept was also developed at the same time, as Dr. Whitney discovered that once the silver was removed from the liquid, the leftover liquid had properties that allowed for very effective essential nutrient uptake in plants. The Company's GOLD'n GRO Multi-Nutrient Fertilizers were introduced in 1998 and have been shown to consistently improve crop quality and yield for more than 20 years.



Secondary nutrients such as, calcium, magnesium and sulfur and micro nutrients such as iron, manganese, copper and zinc are required for successful plant growth in much smaller amounts than traditional phosphorous, nitrogen and potassium fertilizers and are often not present in the soil in an available form or taken up effectively by the plants. Itronics GOLD'n GRO Multi-Nutrient Fertilizers improve the bioavailability of secondary and micronutrient minerals to the plant roots. Field trials have shown them to be ideal for a wide range of vegetable crops, vineyards, and fruit and nut orchards. Additionally, the liquid multi-nutrient fertilizers produced by Itronics have excellent mixability properties not available in other micronutrient fertilizers. This allows GOLD'n GRO to be blended with bulk liquid nitrogen and calcium fertilizers, providing ease of application while greatly expanding the GOLD'n GRO Multi-Nutrient Fertilizer market.

Itronics has developed a synthetic photo liquid that eliminates the Company's reliance on spent photographic liquids which are rapidly being eliminated by the photo industry.

Itronics' consultative approach to selling its multi-nutrient fertilizers continues to uncover additional applications addressing newly recognized soil mineral deficiencies and other mineral deficiencies that have been plaguing farmers for decades. GOLD'n GRO also reduces significant issues such as cadmium uptake into vegetables.

The ability to use fertilizers to solve nutrition problems has led to Itronics being asked by its distributor to develop an accredited national training program for its sales force, and training sessions feature the GOLD'n GRO Multi-Nutrient Fertilizer product lines in the training material. Itronics is the only fertilizer manufacturer in the United States to offer an accredited nutrition training program.

Currently Itronics relies on GOLD'n GRO Multi-Nutrient Fertilizer sales for most of its sales revenue. Agricultural fertilizer sales are a historically highly cyclical and seasonal business. Itronics has identified non-agricultural, non-seasonal sources for its Zero Waste Energy Saving Portfolio Technologies, with the potential for very high sales revenue, which it is developing, that will reduce its dependence on agricultural sources of revenue in the future.

## **SILVER BULLION PRODUCTION**

Silver Bullion Production originated with the refining of recovered silver from spent photo fluids. Itronics also currently operates a pilot scale refinery and makes 3 to 4 shipments of bullion, annually, for further refining.

Itronics currently uses conventional electric furnaces in the pilot plant refinery. Scheduled for late 2020 is the testing of induction furnaces. Induction furnaces allow for better heat control, directly heating the materials to be refined versus heating the crucible and reducing the amount of energy required to complete the refining process.

The main feed into the refinery is silver received from photographic liquids and printed circuit boards. Printed circuit boards and e-waste is a major waste problem worldwide. Collected e-waste in the U.S. is primarily shipped to foreign markets. Itronics is perfectly located to handle e-waste generated in the Western United States, greatly reducing the cost to transport materials to Nevada for refining.

## - PRINTED CIRCUIT BOARD PROCESSING

In 2018, after a two-year research and development effort, Itronics Metallurgical, Inc. (IMI) began producing bullion in their metallurgical operations using scrap printed circuit boards. This has added additional value to the silver-rich bullion that IMI was already producing. The gold, silver, tin, and copper that are found in the boards adds value to the bullion and silver bearing glass that are produced and sold by the Company. Itronics proprietary technology recovers 100 percent of the metals and most of the energy contained in the printed circuit boards.



## - PURE METAL PRODUCTION

The next major technologically innovative step for Silver Bullion Production is the move to Pure Metal Production. Itronics Metallurgical, Inc. has the technology to produce five 9's silver (99.999%) and pure base metal plates or crystals.

### Five 9's Silver

The current bullion production is a combination of silver, gold, copper, lead, and tin, and is technically a silver bronze alloy. Pure Metal Production would separate these combined metals and produce pure individual products. Pure recycled metals sell for a premium price. Production of pure metals at the Itronics Cleantech Materials Campus eliminates the cost of paying both refining fees and a percentage of the metal to a contracted refiner. Reduced production cost plus premium prices for recycled metals make Pure Metal Production the next logical step in upgrading Silver Bullion Production.

## ROCK KLEEN TAILINGS PROCESSING

Rock Kleen Tailings Processing is a revolutionary Itronics Zero Waste Energy Saving Technology development that cleans mine tailings of residual cyanide, and precious and base metals, and makes the previously mined materials available for industrial mineral usage.

**ROCK  
KLEEN**



This is energy saving technology because it avoids the significant energy costs of mining and crushing the rock. Rock Kleen recovers residual metals including both precious and base metals that were not recovered by previous leaching processes.

While Rock Kleen is used at the mine site or at a central location, final metal production will occur at the Itronics Cleantech Materials Campus. Industrial minerals production and sales is a major growth market for Itronics. Producing crushed rock, clays, crushed rock fines and minerals from previously mined tailings provides huge opportunities for this Itronics Zero Waste Energy Saving Technology by saving energy and maximizing materials use. Up to 60 percent of the cost of mining is energy, so the energy cost savings are very substantial.

Rock Kleen is produced by Itronics' proprietary GOLD'n GRO Multi-Nutrient Fertilizer technology. The current industrial mineral market in California-Nevada approaches 300 million tons per year. A Whitney & Whitney marketing survey has identified over 400 million tons of treatable mine leach tails near rail service in the Yerington, Nevada to Tonopah, Nevada corridor.

Itronics technology portfolio can be applied to extract minerals from a large variety of previously processed ore that remains at closed or abandoned mine sites. Furthermore, this methodology will also be incorporated into the Company's Auric Fulstone mine development project.

## - SILVER/GOLD MINE TAILINGS

Itronics technology portfolio can be used to extract minerals from mine tailings at abandoned or closed gold, silver, copper, or poly-metallic mining sites. The Rock Kleen fluids developed by Itronics are also effective at neutralizing cyanide solutions, which is found in tailings produced by the gold and silver heap leaching.



Heap leaching technology is a commonly used method to extract gold and silver from ore. Gold and silver bearing ore is placed on top of a synthetic liner and sodium cyanide solution is slowly introduced to the top of the ore pile. The cyanide solution dissolves silver and gold particles. The gold and silver laden solution is then collected and treated in a process that extracts the gold and silver. Gold/silver bullion is then produced for sale to the open market. Once the ore is processed the contaminated waste pile must be managed in accordance with Federal and State regulations, which requires regulated storage and monitoring.

These activities also require a pollution control bond or insurance instrument be placed with the appropriate regulatory agency in the event that the company owning the mining property is financially unable to fund the on-going waste pile treatment.

In that light, Itronics believes that their technology can be used to effectively remove cyanide, oxide metal, nitrogen, sulfur, and other impurities from mine tailings, while also capturing residual gold and silver that still reside within the tailings.

This converts the treated waste pile rock to salable products and would allow the mine owner to eliminate the need for on-going monitoring and related insurance expenses. The treated waste pile rock would have a crushed rock sales value in certain geographic markets. On-going site monitoring and maintenance and insurance would be eliminated.

Itronics also has the added benefit of being able to capture the fluids used to treat the waste piles and after stripping the minerals out of the fluid, regenerate, and re-use the fluid. This is consistent with Itronics Zero Waste Energy Saving Technology while reducing raw material costs for their on-going operations.

Itronics Rock Kleen technology is effective at removing residual silver and other minerals that remain in silver mine tailings. Itronics has identified a prospective inactive mining site that can be easily serviced by the Itronics Cleantech Materials Campus.

Whitney and Whitney, Inc. provided mine engineering services for the site when it was operating and has significant institutional knowledge about the site. The Company is working to develop a joint venture to process silver heap leach tailings from the site.

## - COPPER MINE TAILINGS

Copper mine tailings are also viewed as a potential non-agricultural use for the Company's technology. The first commercial copper mining district in Nevada is at



Yerington in Lyon County. While these mine tailings do not use cyanide to remove the metals, the mine tailings still have residual minerals within the processed ore along with residual acid and nitrogen. Itronics believes that its technology can also be used to extract residual copper and other minerals from the tailings. As is the case for gold mine tailings, the extraction fluids would be

captured and reprocessed for re-use once the residual copper and other minerals have been extracted from the fluid.

The copper rich concentrates generated by the extraction process could then be refined at the Itronics Cleantech Materials Campus or used as micronutrients in the Company's GOLD'n GRO Multi-Nutrient Fertilizers. Molybdenum is also considered a micronutrient mineral and is produced as a by-product of seven copper mines in the Western U.S. The Company believes that molybdenum could also be produced from the molybdenum/copper tailings for use in their multi-nutrient fertilizers.

In addition to the Yerington district, copper mining occurs in 24 locations in the United States. Based upon the metal grade of the tailings and their location in relation to crushed rock markets, Rock Kleen could be used at other large active and inactive copper mines that exist in the United States.

## **AURIC GOLD AND MINERALS FULSTONE POLYMETALLIC GOLD PROJECT**

Itronics is excited about both its core mineral nutrient fertilizer business and the potential of mineral recovery and extraction businesses that uses the Itronics Zero Waste Energy Saving Portfolio Technologies and incorporates green mining techniques. The Company is equally excited about expanding and developing the Auric Gold and Minerals, Inc. Fulstone Polymetallic Gold Project.



Auric Gold and Minerals, Inc. is a partially owned subsidiary that currently holds a 2,800 acre land position in the Yerington Copper District, Yerington, Nevada.

The Yerington District has been described by the United States Geological Survey as “one of the giant copper porphyry-related metal camps of the world”. Auric currently controls the mineral rights through BLM claims.

Auric believes that the Fulstone claims are prospective for an epithermal gold/silver deposit in addition to porphyry copper and porphyry molybdenum deposits, and strata bound silver, zinc, and lead. Advanced stage exploration has been performed at Auric's Fulstone Polymetallic Gold Project and strong anomalous metal values have been obtained by geochemical sampling, confirming the presence of gold, silver, copper, zinc, lead, molybdenum and iron.

The property is strategically located within 15 miles of the Itronics Cleantech Materials Campus. The Campus would be used to support development of this project, as well as serve as the main manufacturing site for the Company's nutrient fertilizers, silver refining, mineral cleaning, and metallurgical business lines. This work has identified a Nevada typical tertiary epithermal gold system at its Fulstone property in the Yerington Copper District.

The system was identified by field observation and work including fault mapping, geochemistry, and geophysics. Grid type soil sampling has provided strong anomalous gold values over a strongly jointed and strongly discolored leach cap area.



One sample returned a gold value of .4 oz per ton. These characteristics are the model for a typical Nevada tertiary epithermal gold system.

This area has been named the Golden Valley Project. The current known extent of the gold occurrence is 4000 feet by 1000 feet but may be extended with additional sampling. IP/Resistivity geophysics indicates potential mineralized depth to 2000 feet.

It is further believed that the epithermal gold/silver system is an overprint of a Jurassic copper system of the type typically found in the Yerington Copper District. The gold/silver epithermal system used the same faulting system as the earlier copper mineralization bringing copper to the surface and leaving gold and silver minerals in the copper system. Soil samples have returned unusually high values for silver, zinc and lead indicating that a third mineralizing event may have occurred through this active plumbing system. These geologic features make Fulstone the only true polymetallic gold occurrence in the Yerington District.

The Auric Fulstone Polymetallic Gold Project has the potential to be a major Nevada epithermal gold system combined with an “elephant” size Yerington District copper system. “Elephant” size deposits in this district would represent 500,000,000 tons of resource and would generate a mine life 50 years or longer. In combination with the gold and copper possibilities, geochemical tests confirm the presence of silver, zinc, lead, molybdenum, and iron making Fulstone a true polymetallic. Itronics Zero Waste Energy Saving Technologies will be instrumental in the design and development of any project at Fulstone. Itronics Green Mining philosophy uses the Zero Waste Energy Saving Technologies to maximize the use of all the resource, minimize energy consumption, and use of Itronics Cleantech Materials Technologies to address any environmental concerns.

The Auric Fulstone Polymetallic Gold Project is situated at the intersection of two major faulting systems, both prolific mineral producers. On the west side of the district is the N-S faulting system which has a historical high-grade gold mine and a gold discovery which returned one gold assay of 17 ounce per ton over a 3-foot intercept.

This N-S faulting system intersects a major NW-SE faulting system which hosts two “elephant” size copper deposits (Bear and Pumpkin Hollow). These two faulting systems (gold and copper) intersect at the Auric Fulstone Polymetallic Gold Project. Surface geochemical sampling confirms the mineral carrying properties of these faulting systems. This intersection of two mineral producing faults and confirming soil samples make the Auric Fulstone a unique exploration target for tertiary epithermal gold overprinted on a Jurassic copper system.

Auric's Fulstone land package is proving to be a polymetallic gold exploration target of potential major significance.

Auric's personnel have extensive experience exploring the Walker Lane, especially in western Nevada, including the acquisition, and advancement of the Borealis Mine by Dr. John Whitney, president of Whitney & Whitney Inc. Borealis has produced over 625,000 ounces of gold and is currently under lease to Waterton Resources which has been exploring the 23 square mile gold bearing volcanic hosted high sulfidation system. Gryphon Gold had identified 1.4 million ounces of Measured & Indicated gold resources, and 1.1 million ounces of Inferred gold resources and secured permits for and intermittently operated a heap leach operation. These resources have not yet been mined.

Auric's personnel have extensive development and operational experience. Dr. John Whitney worked with the Northern Alaska Native Association for 14 years in the development of the Red Dog zinc mine, the largest zinc mine in the world. Dr. Whitney was involved in the initial discovery, development, and start-up. John Key was an operational General Manager for Teck Cominco for 20 years. Mr. Key was manager of the Red Dog zinc operation for 6 years and oversaw a \$300 million expansion that doubled the output of the Red Dog operations. Mr. Key was President and CEO of Gryphon Gold and oversaw the restart of the Borealis gold mine in 2011.

## **MARKET ESTIMATES**

### **- GOLD'n GRO MULTI-NUTRIENT FERTILIZER SALES**

Our distributor currently sells GOLD'n GRO Multi-Nutrient Fertilizers into a three state area, namely California, Nevada, and Hawaii. The Company uses a consultative sales approach to solve issues faced by the distributor's customers, which has led to interest in the Company's products, not only in the traditional market area, but throughout the Western U.S. Itronics, continues to work with the distributor's sales personnel to perform field trials for different tree and vegetable crops in California. The Itronics Cleantech Materials Campus has rail service, and this would allow the Company to economically produce and transport multi-nutrient fertilizers nationwide and internationally.



### **- PRINTED CIRCUIT BOARD REFINING**

During 2018, bullion produced and sold by the Company's metallurgical operations incorporated printed circuit boards into the feed mix. Nearly 52 million computers are disposed of annually in the United States, all of which contain at least one printed circuit board. This equates to over 38,000 tons of printed circuit boards per year.

As configured, Itronics Metallurgical, Inc.'s pilot operations convert less than 6,000 pounds (3 tons) of circuit boards. Plans are in place to add new scalable electric induction furnace technology to the Reno manufacturing plant, which would double the amount of printed circuit boards processed, while developing additional Research and Development data. That data would be used to design and engineer a 100 times larger furnace installation at the Itronics Cleantech Materials Campus.

## - **ROCK KLEEN TAILINGS PROCESSING**

Rock Kleen is produced by Itronics' proprietary GOLD'n GRO Multi-Nutrient Fertilizer technology. The current industrial mineral market in California-Nevada approaches 300 million tons per year. A Whitney & Whitney marketing survey has identified over 400 million tons of treatable mine leach tails near rail service in the Yerington, Nevada to Tonopah, Nevada corridor.

### o **GOLD/SILVER MINE TAILINGS**

The USGS database has recorded over 12,000 mines in Nevada. Of that total, 5,500 are listed as gold producers, although it is also common for mines to produce other minerals as well. Gold mining is critical to the State's economy. In fact, if Nevada were a country, it would be the world's fourth leading producer and accounted for 83% (166 tonnes) of all gold produced in the U.S. between 2014 and 2015. In 2018, the U.S. was the world's number 4 producer of gold with 210 tons of gold metal (6% of the world total).

It is also important to note that heap leaching is practiced globally, so successful implementation would have potential global marketability for the Company's technology.

Over 3,300 Nevada mines in the USGS database were identified as silver producers. In 2018, U.S. mines produced 900 tons of silver with an estimated value of \$440 million, which places the Country 10th in world production. Itronics has reached out to the current owner of a mining site that is located near the Itronics Cleantech Materials Campus. The current owner has identified over 55 million tons of available material at the site and is focusing their efforts on a 37-million-ton resource for initial development. Itronics has entered into a non-disclosure agreement and has entered into a test agreement with the mine owners that will test the use of Itronics technology for processing the stockpile. Successful tailings processing would provide the Company and its mining partners silver, gold, and additional mineral revenue, allowing each partner the ability to grow their company's revenues using Itronics' technology portfolio.

## ○ COPPER MINE TAILINGS

In 2018 the United States Copper mine production was estimated at 1.2 million tons worth an estimated \$8 billion. This places the country fifth in worldwide copper production. Twenty-four mines recovered copper in the United States. The new Itronics Cleantech Materials Campus is in Lyon County in the Yerington Mining District, which the USGS describes as “one of the giant porphyry-related metal camps of the world.” The Anaconda mine, which ceased operations in 1978, contains over 220 million tons of tailings. Additional quantities are expected in the region as Nevada Copper is developing a new mine and four additional companies hold mineral rights and are at various stages of development for copper and/or gold mining projects in the Yerington Mining District alone. The technology is potentially applicable to all 24 domestic copper mines currently operating in the United States.

## FUTURE PORTFOLIO TECHNOLOGY APPLICATIONS

### - MINERAL NUTRIENT RECOVERY FROM BATTERY PASTE

In 2020, the Company expects to begin testing their technology platform to extract zinc and manganese from battery paste that is a by-product of non-rechargeable alkaline battery recycling. While the metal battery cases are recycled, the battery paste inside the casing is currently not being recycled. The recovered zinc and manganese will be used in their fertilizers and eliminate the need to purchase those products from third party suppliers, some of which are sourced internationally. This source material is expected to reduce the cost-of-goods of the fertilizers.



Alkaline battery paste contains manganese and zinc which are key multi-nutrient fertilizer elements. The Company has used its mineral extraction technology to produce those elements on a pilot scale in a form that can be incorporated into the multi-nutrient fertilizer lines. The battery paste is produced by a battery recycler that removes the paste from the battery. The recycling company generates over 3 million pounds of this paste annually. On a larger scale, Call2Recycle, a non-profit organization that provides cost-free consumer battery recycling service on behalf of the battery manufacturers, commissioned a study to determine the size of the available battery recycling market. The report concluded that in 2014, 257,848,368 batteries were available for recycling. Of that total, 180,905,833 (70.2%) were alkaline batteries.

## - SPENT POT LINER FROM ALUMINUM

Spent pot liner (SPL) is produced as a byproduct of aluminum manufacturing. Processing SPL presents an opportunity to sell the “Rock Kleen” liquids and to license/joint venture the onsite processing technology to produce non-seasonal revenues on a long-term basis.

SPL is the conductive carbon used to line the pots in the electrolytic process that separates elemental aluminum from the alumina raw material used to produce aluminum products. SPL is regulated as a hazardous waste by the USEPA (K088), as the waste contains cyanide and a few heavy metals, as well as considerable amounts of sodium and fluoride.

In addition to the hazardous chemicals the SPL also exhibits corrosive and water reactive properties, which produce explosive gas mixtures of hydrogen and methane. Additionally, the toxic fluoride and cyanide compounds are leachable in water.

Itronics believes that all hazardous properties associated with SPL can be eliminated using their proprietary Rock Kleen Technology. This offers significant cost advantages over the thermal treatment process currently employed.



Spent Pot Liner provides a potential international market for the Company’s mineral recovery technology. The Jawaharlal Nehru Aluminum Research and Design Centre, Nagpur, India made a presentation to the 3rd International Conference on Alternate Fuels and Raw Materials in Cement Industry, which was held March 23-24, 2017. The presentation estimated that approximately 1,750,000 tonnes of SPL were produced worldwide in 2017 and forecasted growth of SPL generation by 2030 to approximately 3,000,000 tonnes, of which 350,000 tonnes is estimated to be the first cut hazardous SPL component. While growth in North America is not expected beyond the 50,000 tons currently being generated, the production technology that is used in North America also is used worldwide. This makes SPL environmental management a significant international issue. The Jawaharlal conference focused on treating the SPL to reduce the hazards and take advantage of the BTU content for use as alternative fuel in cement making.

Itronics believes that their technology could be used to produce marketable graphite, which has a higher economic end use value than graphite as fuel. According to an article published by Investor Intel in September, 2017, worldwide demand for graphite is nearly 2.5 million tons and the world is experiencing a shortage due to changes that are occurring in China and demand from electric vehicles and other lithium ion battery usage.



The anode market alone, which accounted for 80,000 tons per year in 2015, is expected to grow to at least 250,000 tons per year and as much as 400,000 tons per year by 2020.

## - AIR POLLUTION CONTROL DUST

Air pollution control dust produced by brass, bronze and iron smelting are also non- agricultural applications that the Company views as longer term candidates for the Company’s technology portfolio.

The USEPA 2017 Biennial Database identifies 883 generators of Air Pollution Control Dust (Source Code G21) that collectively generated 1,765,675 tons of which 1,007,406 tons were shipped offsite. The data shows that 753,080 tons were processed by metal recyclers. Throughout the U.S. 47 states report having at least one location generating air pollution control dust and at least one operating foundry.

Zinc and iron rich by-products are produced by the furnaces’ air pollution control equipment. EAF (Electric Arc Furnace) waste represents the largest percentage of wastes recycled in 2017, with 696,066 tons or 92% of all Air Pollution Control Dust processed.

The International Lead and Zinc Study Group (ILZSG) released its Global demand forecast for 2019 and 2020 in October of 2018. According to ILZSG, global zinc demand is set to rise by 0.4% in 2018 to 13.74 million tons and by 1.1% in 2019 (13.88 million tons). The ILZSG also looked at demand figures for other large geographic markets, as follows:

<b>Region</b>	<b>2018</b>	<b>2019</b>
<b>China</b>	(0.5%)	+0.8%
<b>United States</b>	+2.1%	+0.9%
<b>Europe</b>	+1.6%	+1.0%
<b>Other markets</b>	Stable	Stable

On the supply side, zinc mine production was projected to rise 2% in 2018 and 6.4% in 2019. The global zinc market is projected to be in deficit both in 2018 and 2019. According to the report, demand will exceed supply by 322,000 tons in 2018 and 72,000 tons in 2019.

From a pricing perspective, the World Bank in its commodity forecast report estimated that the average spot price for zinc would be \$3,000/tonne in 2018 (up from \$2,900/tonne in 2017). However, pricing is expected to fall to approximately \$2,683/tonne in 2019 and continued price declines to \$2,581/tonne by 2020.

While air pollution control dusts are excellent candidates for the Company's technology, they are generated in quantities that far exceed current production capability of the Company's GOLD'n GRO Multi-Nutrient Fertilizers. Therefore, this is considered a longer-term prospect for Itronics and would require the addition of very large-scale production equipment at the Itronics Cleantech Materials Campus to process excess material not being used in the GOLD'n GRO Multi-Nutrient Fertilizer manufacturing.

**Founder, President, CEO**

Dr. John W. Whitney

**NAICS Number**

325314

**Industry**

Fertilizer Manufacturing

**Transfer Agent**

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**Fiscal Year ends**

December 31, 2019

**Shares Outstanding**

16.2 Million (12/31/2019)

**Dec 31, 2019 Closing Price**

\$0.48

**52 Week High**

\$0.99

**52 Week Low**

\$0.36

**Market Capitalization**

\$7.8 million (12/31/2019)

**Avg Daily Trading Volume (12 months)**

2,311 shares

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The ancient symbol for Gold is the Sun

The ancient symbol for Silver is the Moon

The Sun symbolizes Itronics rural gold mining developments

The moon symbolizes Itronics urban mining for silver through industrial waste streams

The orbits symbolize the constellation of advanced Hydrometallurgical technology opportunities for Itronics