



REVERSE IONIZER™

green technologies for buildings



I. SUMMARY

Reverse Ionizer, LLC, (“RI” or the “Company”), has developed a patented breakthrough technology that combines two proven water treatment methods with advanced non-thermal plasma. This technology, the Plasma Disinfection System (“PDS”), has been shown to effectively mitigate pathogens (Legionella and other bacteria, viruses and parasites) in cooling tower water systems that could be inhaled through evaporative drift. Tests have shown that if the virus is waterborne, RI’s PDS has the potential to destroy any virus, including the COVID-19 virus. (View the video on RI’s home page at www.reverseionizer.com.)

To date, tests conducted by RI, based in Herndon, Virginia, and by independent laboratories, demonstrate that RI’s technology can be a disruptive innovation in the water treatment industry. Powered by its patent and patent-pending plasma and RF-based technology, the Company is positioning itself to introduce a product into the marketplace that will provide building and facility owners more reliable, cost-effective and less risky methods of water treatment compared to what has been available at any time.

Management is not aware of any effective “continuous kill” bio-contaminant treatment system in the marketplace today. Based on test results to date, Reverse Ionizer’s PDS would be the only system designed to provide near 100% effective water treatment.

Reverse Ionizer plans to be a licensor of its technology, rather than a manufacturer and marketer, to selected strategic partners who will manufacture, market, and lease the product lines as well as provide customer service to the lessees. This structure is expected to significantly reduce the internal infrastructure, capital investment requirement, and time frame needed to enter the marketplace and begin generating revenue. RI will be an IP technology company that develops and licenses its technology while providing appropriate support to these partners.

With a field pilot program scheduled to commence this summer at the Becton Dickinson world headquarters campus in Northern New Jersey, Reverse Ionizer plans to concurrently pursue manufacturing and service relationships with an objective of market introduction in early 2021.

II. BUSINESS BACKGROUND

Several years ago, Marriott International and other hotel owners installed an RF-based system that had been developed to address the scaling problem in cooling towers. At that time, Marriott had estimated that if a successful system could be deployed throughout its 4,000-hotel network, a savings of \$150 million could be realized annually in chemical costs. That system required further engineering which led to the Reverse Ionizer's formation and subsequent work on plasma and electromagnetic technologies.

In 2018, the CDC and EPA sponsored the Water Science and Technology Board of The National Academies of Sciences, Engineering and Medicine (NASEM) Committee's four public hearings on the Management of Legionella in Water Systems. In August 2019, NASEM published that it believes the real number [of Legionnaires' disease cases] approaches 70,000 cases per year in the United States. Dr. Paul Edelstein, an infectious disease specialist in Philadelphia and Legionnaires' disease researcher, says 100,000 cases could be occurring each year in the U.S. The CDC is usually quoted that 1 in 10 cases are fatal, with some reports saying the mortality rate is in the 5-30% range. One outcome of the NASEM hearings is that the world seeks a "continuous kill" solution, which the Reverse Ionizer PDS can provide.

Reverse Ionizer has undertaken significant research and developed a revolutionary plasma and radio frequency-based technology aimed at denaturing and reversing the polarity of scaling ions to eliminate all biological growth in cooling towers, while also greatly mitigating scale and corrosion that reduces the life of cooling towers. RI's core patented technology can be used in many commercial or industrial applications, initially in United States and then rolled out internationally.

III. TARGET MARKETS

Within the clean tech water treatment industry, Reverse Ionizer is initially targeting the U.S. cooling tower market which has an estimated two million installations with approximately 35,000 new cooling tower systems being shipped each year. The new installation market has been trending upwards at almost a 5% growth rate with forecasted revenues exceeding \$4.5 billion per year by 2025. Management believes the addressable market for small and large systems of its plasma technology can be up to 50% of the total cooling tower market.

Currently available chemical water treatment solutions are costly, degrade operating efficiency, cause significant corrosion and increase operation and maintenance (O&M) costs. The Department of Energy estimates that ¼" scale build-up causes an increase of up to 40% more in energy usage. RI estimates that its 'all-in' integrated, retrofit and maintenance program should enable building and facility owners to recoup the investment in RI's technology in two to three years.

The market demand for both of Reverse Ionizer's technologies extends beyond economic considerations for building owners. In New York City, for example, there are more than 20,000 cooling tower systems which require effective control of biological hazards as recently mandated by the city council.

Beyond the initial target market of these cooling towers, management expects to expand the market coverage of its PDS and ExB products to data centers and other industrial applications such as desalination, oil and biomass pipelines, and food processing. **In addition, an industry expert believes the PDS could be implemented in the fresh (potable) water systems of large buildings which could become the Company's largest market.**

IV. PRODUCTS

Reverse Ionizer has developed the following two technologies/products that it plans to introduce into the marketplace with the PDS targeted for early 2021, to be followed by the ExB probe system:

The **Reverse Ionizer™ Plasma-based Disinfection System (PDS)** provides continuous reduction and management of *Legionella* and bacterial growth in a circulating water system to levels <10 CFU/ml, while also controlling and managing the bacteria population on a continuous basis to achieve a healthy, safe and balanced environment in full-scale water systems (such as cooling towers) to minimize the risk of contaminated water droplets being released into the air in and around public spaces.

The **Reverse Ionizer™ electromagnetic (ExB) probe** system addresses the scaling problem in cooling systems, reducing the need for toxic chemicals by making the scaling softer for easier removal. The ExB probe system operates its high-frequency electric and magnetic field signal 40,000 times faster than the low-frequency-pulsed signals of competitors' one size fits all magnetic coil wrap systems.

RI has initiated discussions with potential technology licensees for the manufacture, distribution, installation, maintenance and service of the PDS and ExB probe system.



RI's dual-cell Plasma Disinfection System (PDS) pilot units (shown above) have been installed and set up to begin pilot field testing in the Becton Dickinson HQ's physical plant in July 2020.

V. TECHNOLOGY AND INTELLECTUAL PROPERTY

As a patent-based technology company, Reverse Ionizer has built, and continues to build, a dominant patent position for the in-line treatment of water using applied electromagnetic and advanced non-thermal plasma technologies.

The Company's growing patent portfolio includes eleven issued U.S. patents and five pending patent applications which cover dual-field electromagnetic water treatment devices for applying electromagnetic fields to liquids, using a water-immersible probe configured to generate electromagnetic output fields effective to remove scale, prevent the growth of scale and/or eliminate microbes in a water supply system. Two applications cover resource savings, such as water, energy, power, amount of de-scaling chemicals, device lifetimes, data analytics and system depreciation as well as our recent plasma-based technology. Management does not anticipate anyone being able to design around the core features.

These patents, both issued and pending, cover a wide range of innovations such as:

- the use of plasma and electromagnetic fields to eliminate bacteria in water,
- the control of electromagnetic fields to reliably and predictably reduce the formation of scale and other harmful contaminants in water over a wide range of changing water conditions and conductivities,
- the ability to treat water as it continually flows through large water supply and distribution networks, such as those used in data centers, desalination plants, and oil/gas production facilities,
- the remote monitoring of real-time water conditions to allow maintenance and service personnel to use just-in-time, "water-treatment-as-a-service" protocols,
- the first-ever use of non-thermal plasma aimed at 99.9999% (Log 6) biological denaturing, 99.99% (Log 4) virus removal, and 99.9% (Log 3) parasite removal, and
- the removal of deadly radionuclides from water.

Reverse Ionizer's existing patent portfolio protects the Company's innovative technologies until 2033 and beyond. Every named patent inventor listed on each of the patents in the Company's patent portfolio has provided their assignment to Reverse Ionizer Systems, LLC ("RIS"), which is a wholly-owned subsidiary of Reverse Ionizer. To date, there have been no challenges to the validity or patentability of any of the Company's issued patents.

The Company will continue to focus on broadening the scope of its patent protection in the fields of non-thermal plasma technology, remote monitoring, and water-treatment-as-a-service technologies. RI's goal is to have a minimum of twenty issued U.S. patents in water treatment by mid-2021.

VI. COMPETITION AND PRODUCT/SERVICE DIFFERENTIATION FOR CUSTOMERS

Cooling tower treatments have been dominated by hazardous, corrosive and environmentally damaging chemicals during most of its 100-year existence. No other company has ever successfully engineered a near 100% effective non-chemical electromagnetic or plasma system to mitigate scale and biocontamination of water treatment systems.

According to a long-tenured deputy director of the Pentagon's operations & maintenance facilities, there are only two nationally recognized providers of competitive physical water treatment (PWT) devices. The first (Dolphin) was never considered to be reliable and the second (Silver Bullet), using an ultraviolet-based technology, required 50% biocide supplements to treat for biological contaminants while its scaling treatment was highly ineffective.

Management is not aware of any effective “continuous kill” bio-contaminant treatment system in the marketplace today. Based on test results to date, Reverse Ionizer’s PDS would be the only system designed to provide near 100% effective water treatment.

VII. MANAGEMENT

Reverse Ionizer was founded by experienced entrepreneurs and is managed by individuals with previous experience in starting up, managing, and selling businesses. In addition, the Company has reinforced its financial, marketing, technical and operating capabilities with the enlistment of highly experienced board members and advisors.

Patrick Hughes, Chief Executive Officer & President, has led the Company since he co-founded Reverse Ionizer. Previously, he created the original software engine for the multibillion-dollar online fantasy sports industry and sold the business to News Corporation. His software games and books are part of the Pro Football & Major League Baseball Hall of Fame collections. Previously to that, he owned and sold his equipment brokerage business to a Fortune 500 company. Pat has prior exceptional sales experience with Pitney Bowes and twice with IBM and is a named inventor on more than 30 U.S. patents.

Christopher Burch, Executive Vice President & CFO, is a co-founder who had previously held executive-level management positions in several private and public firms in which he has helped raise funds, expand operations and executed exit strategies for the equity holders. A one-time federal bank regulator, Chris has also previously led a leveraged buyout of a large mid-Atlantic medical services company.

Desmond Fraser, Chief Technology Officer, leads the R&D effort for Reverse Ionizer. An engineer with 33 years of design experience in electromagnetics and plasma engineering, Desmond founded Rhein Tech Laboratories, Inc., an electromagnetic engineering and systems hardware design company, more than 30 years ago. Desmond and his Rhein Tech engineers have made significant contributions to the development of Reverse Ionizer’s patented technology.

VIII. FINANCIAL INFORMATION

Reverse Ionizer plans to generate revenue through the licensing of its technology to strategic partners who would be required to manufacture and lease a minimum number of products utilizing the Company’s patented technology. These partners would pay licensing fees to the Company based upon negotiated agreements. RI anticipates initially entering into such agreements with two licensees for 2021, adding one additional licensee in each of years 2022 and 2023, and a fifth licensee in 2025.

By 2025, each of the five licensees is projected to lease and install, at minimum, an average of 2,000 units per year for a total of 10,000 new units each year. With a projected 12,500 units previously leased in years 2021 through 2024 and assumed to be in place, the total number of units in place is projected to be 22,500 by the end of 2025. Based on these installed units, the Company projects receiving licensing fees totaling \$105,000,000 in 2025 as shown in Schedule 1 on the following page.

Based on current market conditions with COVID-19 and other environmental concerns, as well as the anticipated marketing, manufacturing, and distribution capabilities of selected licensees, the resulting demand for the Company’s proprietary disinfection and electromagnetic technologies could well exceed the assumptions underlying the Company’s current revenue projections.

Schedule 1

Reverse Ionizer, LLC					
Revenue and EBITDA Projections					
(\$ in Thousands)					
	2021	2022	2023	2024	2025
Units Leased by RI Licensees					
Total New Units	400	2,100	4,000	6,000	10,000
Total Units in Place	400	2,500	6,500	12,500	22,500
Revenue					
RI License Fees	1,200	8,700	27,000	57,000	105,000
Expenses					
Salaries & Benefits	1,155	1,351	1,968	2,202	2,467
Consultants -Technical	720	792	871	958	1,054
Consultants	120	126	132	139	146
Insurance	30	31	32	33	34
Legal	50	52	27	27	28
Office	83	97	141	157	176
Patents	102	105	56	57	59
Rent	120	124	158	163	168
Telephone and Computer	20	21	22	23	24
Travel and Entertainment	36	37	38	39	41
Utilities	18	19	19	20	20
Other	120	126	132	139	146
Total Expenses	2,574	2,879	3,596	3,958	4,363
EBITDA	(1,374)	5,821	23,404	53,042	100,637

As a licensor of technology, the internal infrastructure and capital investment is considerably less than what would be required to support full scale manufacturing and sales. Consequently, Reverse Ionizer anticipates maintaining a relatively small headcount to support corporate functions, the continuation of R&D for existing and new applications, new patent generation and protection, as well as development and maintenance of its licensee relationships. As a result, the Company is expected to generate significant funds, most of which are currently projected to be distributed to unit holders as shown in Schedule 2, subject to potential business opportunities that would require more funds to be retained than presently projected.

As shown in Schedule 2 on the following page, capital to fund Reverse Ionizer is expected to be generated from both capital raising efforts in 2020 and 2021 as well as from operations (licensing fees) received in 2021 through 2025.

Schedule 2

Reverse Ionizer, LLC						
Projected Sources and Uses of Funds						
(\$ in Thousands)						
	Jun-Dec 2020	2021	2022	2023	2024	2025
Sources						
Financings	3,000	2,000				
Operations -EBITDA	(940)	(1,374)	5,821	23,404	53,042	100,637
Total Sources	2,060	627	5,821	23,404	53,042	100,637
Uses						
Working Capital Increase	-	84	525	1,281	2,100	3,360
Accounts Payable Reduction	150	50	-	-	-	-
Financing Fees and Expenses	300	200	-	-	-	-
Loans to Unit Holders incl. Interest	120	749	-	-	-	-
Payroll & Payments-Accrued	190	137	-	-	-	-
Rent-Accrued	50	50	-	-	-	-
Total Uses	810	1,270	525	1,281	2,100	3,360
Net Funds Generated	1,250	(644)	5,296	22,123	50,942	97,277
Proj. Distributions to Unit Holders	-	-	3,000	20,000	45,000	95,000
Retained Funds	1,250	(644)	2,296	2,123	5,942	2,277
Cumulative Retained Funds	1,250	607	2,902	5,025	10,967	13,244

IX. MILESTONES AND CURRENT EFFORTS

Tests of the PDS, conducted by Dr. Richard Danielson of the world-renowned BioVir Laboratories, using M2 Phage virus, produced a 7.3 log reduction. These tests also determined that if the virus is waterborne, RI's PDS has the potential to destroy any virus, including the COVID-19 virus.

PDS testing at the renowned Special Pathogens Laboratory (SPL) in Pittsburgh was conducted during 2019 with results indicating the goal of reducing, managing and controlling Legionella growth in a circulating water system to levels at 10 CFU/ml, the regulatory limit for many states, can be achieved with the PDS

Recently, former Acting U.S. Surgeon General Kenneth Moritsugu joined Reverse Ionizer's board to help guide the PDS technology rollout.

In March 2020, two senior scientists at EPA's Office of Homeland Security, along with a senior microbiologist, who is charged with undertaking research to *improve drinking water quality by studying environmental bacteria that grows in water systems*, informed us that the EPA has begun their legal process to procure RI's PDS device for testing, with a target date of mid-summer 2020.

EPA's Sally Gutierrez has recommended forming a public-private partnership (PPP) with Reverse Ionizer, in which RI would like to include its partner, Becton Dickinson, and CBRE, the largest commercial real estate services company in the world, who introduced RI to the renowned water treatment expert guiding the proof-of-concept field trial at Becton Dickinson's New Jersey HQ campus this summer.

Two PDS pilot units have already been installed at Becton Dickinson to begin field testing this summer with a planned white paper to be published in the fourth quarter of 2020.

With RI's proof-of-concept prototypes receiving exceptional lab test results, the Company is now working on an accelerated trajectory toward field testing and establishing strategic licensee relationships to deploy RI's initial PDS product line.

To support the remaining efforts prior to market introduction, the anticipated requirements for the product line roll out and the establishment of a licensor infrastructure, Reverse Ionizer is currently evaluating strategic relationships and undertaking a capital raise.

For more information, please contact:

Patrick Hughes

703-403-7256

phughes@reverseionizer.com

THIS PROFILE IS NOT AN OFFERING OF SECURITIES

The contents of this Profile are not intended to be a solicitation of an investment and any future solicitation will be subject to the potential investor being provided with documentation and the opportunity to review other documentation issued by the Company.

This Profile is not an invitation to invest. You are not being asked for funds or any type of commitment at this time, nor will the Company accept funds or any type of commitment from you until all documentation is duly executed by all parties.

The sole purpose of this Profile is to assist the recipient in deciding whether to proceed with an in-depth investigation of the Company in accordance with procedures established by the Company. This Profile does not purport to contain all the information that may be required to evaluate all the factors which would be relevant to a recipient considering entering into any Transaction and any recipient hereof should conduct its own investigation and analysis.

(Continued Next Page)

While the information contained herein is believed to be accurate, the Company and its representatives have not conducted any audit or investigation with respect to such information, and the Company and its representatives expressly disclaim any and all liability for representations, expressed or implied, contained in, or for omissions from, this Profile or any other written or oral communication transmitted to any interested party in the course of its evaluation of the Company. Only those particular representations and warranties which may be made by the Company in a written subscription agreement or written definitive purchase agreement, when and if one is executed, and subject to such limitations and restrictions as may be specified in such subscription agreement or purchase agreement, shall have any legal effect.

This Profile may contain certain statements, estimates and projections provided by the Company with respect to its anticipated future performance. Such statements, estimates, information and projections reflect significant assumptions and subjective judgments by the Company's management concerning anticipated results. These assumptions and judgments may or may not prove to be correct and there can be no assurance that any projected results are attainable or will be realized. The Company and its representatives make no representations or warranties as to their accuracy, truthfulness or completeness. Except where otherwise indicated, this Profile speaks as of the date hereof. Neither the delivery of this Profile nor a Transaction with the Company shall, under any circumstances, create any implication that there has been no change in the affairs of the Company since the date hereof. In furnishing this Profile, the Company and its representatives undertake no obligation to update any of the information contained herein.