City of Bellingham

76B-2023
Solids Handling Pilot Program RFP

Peter Janicki
Chief Executive Officer
Sedron Technologies
133 W. State Street, Suite 101
Sedro-Woolley, WA 98284

November 2, 2023

Subject: Solids Handline Pilot Program RFP 76B-2023

The enclosed response is submitted in response to the above-referenced Request for Proposal. Through submission of this proposal, we agree to all of the terms and conditions of the Request for Proposal.

We have carefully read and examined the Request for Proposal and have conducted such other investigations as were prudent and reasonable in preparing the proposal. We agree to be bound by statements and representations made in this proposal and to any agreement resulting from the proposal.

Yours truly,

_____

Signature

Name: Peter Janicki
Title: Chief Executive Officer

Legal name of proponent: Sedron Technologies, LLC

Date: November 2, 2023

SOLIDS HANDLING PILOT PROGRAM RFP RESPONSE

CITY OF BELLINGHAM – RFP # 76B-2023

November 2, 2023

Sedron Technologies, LLC | 133 W State Street, Suite 101, Sedro-Woolley, WA 98284 USA
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Thursday, November 2, 2023

Dear City of Bellingham,

Thank you for the opportunity to present our proposed testing solution for a biosolids processing alternative technology. We are pleased to share a very viable and economically advantageous proposal that will demonstrate the viability and inherent advantages of our Varcor® technology in processing the biosolids produced at your Post Point facility.

Based on the information presented in the RFP and on what we learned during our tour of the site, we believe our test unit will be a perfect fit for this use case. This unit is a scaled-down version of a full-size Varcor that was designed specifically testing the effectiveness of various waste streams with our technology. Operationally, it uses the exact same technologies and processes as a full-size Varcor, just on a smaller scale.

As your Skagit County neighbor, we are personally and professionally vested in the success of this project. The opportunity to do a project like this within 25 miles of our headquarters in Sedro-Woolley is very exciting. Sedron and our sister company, Janicki Industries, have a long and well-established track record of taking on and solving highly complex engineering challenges. That track record gives us complete confidence that our proposed solution will meet your needs and exceed your expectations. We look forward to working with your team on this project!

Sincerely,

Peter Janicki

CEO, Sedron Technologies

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EXECUTIVE SUMMARY

At Sedron Technologies, we have always been very interested in partnering with our neighbors in Skagit and Whatcom counties, so we are very grateful for the opportunity to submit our proposal for your Solids Handling Pilot Program RFP. We are positioned to deliver a unique and effective solution to your Solids Handling challenges in the form of a pilot program using our Varcor® test unit, and potentially as a full-scale Varcor deployment as a next step.

We are confident that our proposed pilot program will lead to the deployment of a full-scale Varcor solution at your Post Point Facility. So confident, in fact, that we are willing to credit 100% of the cost of the pilot program to offset the cost of deploying of a full-scale Varcor solution at Post Point within 3 years of the completion of Final Acceptance Testing for the pilot program.

Here's what we bring to the table:

- **OUR VARCOR TEST UNIT.** In 2020, we built a scaled-down version of our Varcor® waste processing system specifically for the purpose of testing different waste streams as a proof of concept for our solution. We have used this unit to successfully complete tests on a variety of waste streams. In each case, we were able to validate that our technology provided a superior technical solution to the challenges each customer was facing. Because the test unit was designed for pilot testing, it has a small footprint that allows for rapid set-up and decommissioning.
- **THE VARCOR WILL SAVE YOU MONEY.** Because the Varcor provides nitrogen removal with no side stream returned to Post Point, we estimate that we can save the City of Bellingham $19-$21M in CapEx, based on Technical Memorandum No. 20. Also, for both the pilot project and a potential full-scale implementation, Sedron would reduce the challenges and costs of increasing staffing during by providing all necessary operators. Technical Memorandum No. 23 estimates that an additional 5-6 staff will be needed at Post Point to operate new biosolids equipment and nutrient removal equipment.
- **DEMONSTRATED EXPERTISE**. We have several experienced engineers and technicians on staff in Western Washington who designed and performed the tests referenced above. We know how to do it in a way that minimizes impact on our host's operations and delivers results. We will not be using this pilot project as an opportunity for The City of Bellingham to subsidize our development.
- **PROVEN TECHNOLOGY; NOT A SCIENCE PROJECT.** Both our test unit and our full-scale Varcor solutions are commercially proven technologies that have been successfully deployed in the field. We also have multiple projects with signed contracts that are under development right now with a targeted deployment in the next 18 months. No one wants to be a "first-of-kind" for unproven technologies. You would not be taking that risk by going with our proposed solution. The Varcor uses a well-established electro-mechanical process that avoids the downtime from the inherent challenges of maintaining system stability for biological processes like anaerobic digestion, and thermochemical processes like gasification. In addition, The Varcor completely avoids the sticky phase, a major operations challenge that typically comes with handling dewatered sludge, dramatically reducing a leading cause of downtime.
- **WE ARE YOUR NEIGHBORS.** We breathe the same air, drink the same water, and act as stewards of the same geography as the residents and leadership of the City of Bellingham. We are similarly vested in improving how biosolids are managed in the area and optimizing the outcomes for all of us in the region. In addition, Sedron is a proud local innovator and employer of WWU graduates at our state-of-the-art manufacturing facilities in Bellingham and at our headquarters in Sedro-Woolley. Our close proximity is ideal for a long-term partnership over the life of the project. It will also help to maximize system uptime by reducing turnaround times for obtaining spare parts, consumables, and performing repairs.

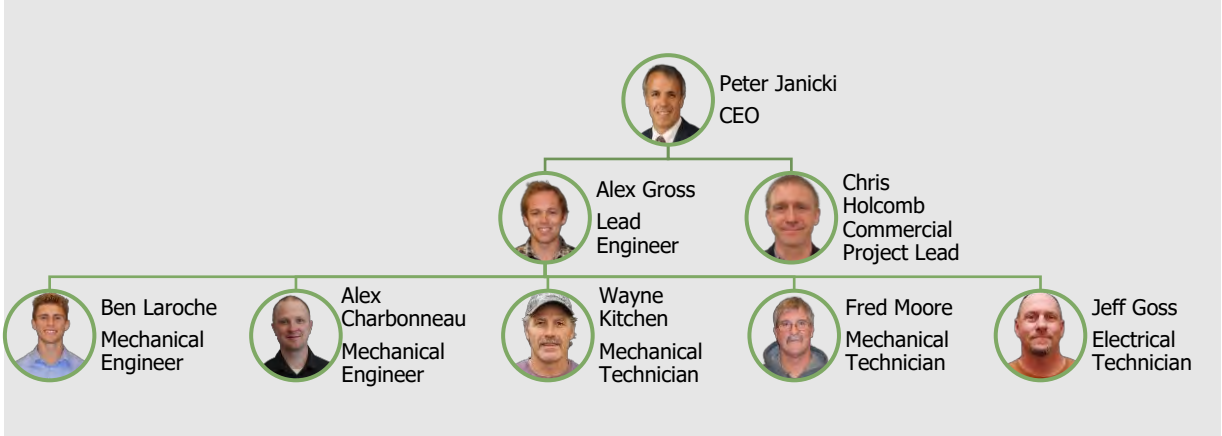
- **REDUCED CO_2 EMISSIONS IN SUPPORT OF YOUR 2018 CLIMATE ACTION PLAN.** The City's 2018 Climate Action Plan has the ambitious goal of reducing sewer utility CO_2 emissions by 60-80%. The Varcor will help the City meet these goals in the following ways:
    - By eliminating the need for dewatering, an energy-intensive step in wastewater treatment,
    - Avoiding the need to add costly polymers and their associated GHG emissions from manufacturing and transportation. This also reduces the amount of operator attention required for polymer dosing, and
    - Mechanical Vapor Recompression (MVR) is 30 times more energy efficient than traditional drying and utilizes electricity that can come from renewable energy with minimal need for fossil fuel such as natural gas.

Thank you for the opportunity work together on this exciting project! We look forward to the next steps in the RFP process. Also, we are always available to answer questions or clarify anything in this document or in general should the need arise. You can reach us directly by contacting Tim Evenson at Tim.Evenson@sedron.com or by phone at (425) 985-7603.

TEAM STRUCTURE & BUSINESS APPROACH

TEAM STRUCTURE

The anticipated team structure is outlined in the following project org chart:



Proposed Project Org Chart

A dedicated Lead Engineer will be assigned to the project to oversee all steps, including modifications of the current pilot unit, installation, material testing, removal, final acceptance, any shipping logistics and completion of the final document with findings for the City of Bellingham. Sedron's CEO, Peter Janicki, will be personally engaged in this project and will be leading the technical effort. In addition, another engineer, a Commercial Project Lead, and three mechanical technicians will be assigned to support the Lead Engineer throughout the project lifecycle.

This team will work on the project through each phase of the project, including:

- Planning & Engineering
- Shipping & Installation
- Testing Operations
- Removal
- Report Compilation

During all aspects of this project, Sedron's CEO, a Lead Engineer and a Commercial Project Lead will be dedicated to this project.

With the Post Point Wastewater Treatment Plant (WWTP) less than 10 miles from one of Sedron's Bellingham facilities and less than 25 miles from our headquarters in Sedro-Woolley, we are planning on having additional engineers or technicians available to support the on-site operational testing phase to guarantee project success.

QUALIFICATIONS

Recent qualification and expertise of each potential team member:

Name	Title	Years of Experience	Relevant Qualifications
Peter Janicki	CEO	30+	Founder of Janicki Industries and CEO of Sedron Technologies
Alex Gross	Lead Mechanical Engineer	6	BS in Mechanical Engineering. Designed and developed the Varcor test rig. Operated the

			Varcor test rig extensively locally and on-site.
Chris Holcomb	Project Development Lead	10	MS in environmental sciences and policy. Industrial scale biosolids gasification at three municipal wastewater treatment facilities. Has developed 3 projects valued at over $20M over his career.
Alex Charbonneau	Mechanical Engineer	1	BS in Mechanical Engineering. Hands-on experience operating the Varcor test rig to evaluate Varcor influents
Ben LaRoche	Mechanical Engineer	4	BS in Mechanical Engineering. Designed and developed the system dynamic model and software for the test rig.
Fred Moore	Mechanical Technician	43	Over 40 years of experience in mechanical assembly work, including welding, for a variety of industries – military, aerospace, automobile, refinery etc.
Wayne Kitchen	Mechanical Technician	30	Over 30 years of hands-on experience. 12 Years working as a diesel Mechanic before coming to Sedron in 2015. Over 5 years of leading onsite commissioning and assembly for the Varcor at each site of operation.
Jeff Goss	Electrical Technician	35	Extensive experience in mechanical and electrical assembly. Integral in electrical integration, communication wiring, and troubleshooting.

COORDINATION & COMMUNICATION

Sedron Technologies proposes that we use our Varcor "test unit" to complete this pilot. The test unit is a small-scale, fully functional Varcor that was specifically designed and built for testing waste streams from all the industries we serve. The test unit was originally built at the request of a large liquor distilling company to test the viability of processing stillage and vinasse at their distilleries around the world. It was designed to fit into shipping containers to facilitate moving it from location to location. It has successfully completed multiple tests on wide variety of feedstocks, and it is currently located in Sedro-Woolley.

In terms of coordinating with the City to successfully pilot our system, Sedron has developed a high level of expertise in working with a wide array of customers, including WWTPs, dairy farms, distilleries, and ethanol plants. In addition, due to our close integration with Janicki Industries, many members of our team have significant experience working with aerospace companies as well. As such, our team is adept at building a customized project management plan to meet the specific preferences of each customer.

We believe that shared objectives are the key to a successful project, and we will work closely with the City of Bellingham from the project kickoff through project completion to make sure we are fully aligned on those objectives. We recommend establishing a joint project leadership team, consisting of

1-3 key leaders each from The City of Bellingham and Sedron Technologies. This team would meet frequently and be accountable to one another to work together to meet the shared objectives of the project.

Led by this project team, Sedron proposes an in-person kick-off meeting of all assigned personnel to ensure project objectives are laid out in detail and agreed-upon prior to the commencement of any work streams. Following the kick-off meeting, Sedron proposes having a weekly 60-minute meeting in which the project leadership team will communicate project status and performance with key stakeholders for the duration of the project.

OTHER LOGISTICS

Initial Testing in Sedro-Woolley

With the Varcor test unit currently located in Sedro-Woolley, we propose doing the first phase of initial testing at our manufacturing facility there. We anticipate there will be some fine tuning required to dial-in the process to the unique characteristics of Bellingham's specific waste streams, and that can be done most efficiently on-site in Sedro-Woolley. Close proximity to our engineers and technicians will position us to progress quickly through the start-up phase of the project. Also, starting the pilot in Sedro-Woolley will minimize the amount of time the Varcor test unit is on site at the City of Bellingham's WWTP, keeping disruption of on-site operations to a minimum.

During this first phase of the pilot, Sedron will coordinate the transfer of biosolids from the Bellingham WWTP to Sedro-Woolley, taking approximately 600 gal/week in one truckload for the length of the initial testing period. Sedron will take full responsibility for transporting testing material from the City of Bellingham WWTP to the Varcor test unit, and for returning the post-processing by-products back to the Bellingham WWTP for disposal or beneficial re-use.

Upon completion of the initial testing onsite in Sedro-Woolley, the test unit will be shipped to Bellingham's Post Point facility and installed in the agreed-upon location. Trucking will be provided and set up will be coordinated by Sedron in cooperation with your on-site staff.

A detailed schedule outlining this proposed approach is presented in the ***PROPOSED SCHEDULE*** section below.

Utility Hook Ups

The Varcor test unit requires one source of 200-amp, 480 V, 3-phase power. While a certified electrician is required to make the electrical connection, the system is designed to be "plug-and-play" and takes less than a day to connect. In addition to electricity, the Varcor test unit will require a water connection at 5 gallons per minute (gpm) at 30 psig. Lastly, the Varcor test unit will require a drain connection for the discharge of condensate and distillate from the system while onsite in Bellingham. The test unit is configured to drain via gravity through a 2-½ inch hose but can be configured with a lift station to pump drained liquids to a specified location. Connections are designed and installed on the test unit, and it is planned that Sedron will utilize the Bellingham's connections for all three of these.

Sedron has proposed that The City of Bellingham will provide a connection to existing utility services at their expense and cover the cost of electricity.

Biosolids Streams to be Tested

With the majority of the work required for this test in the modifications, set up, and commissioning, Sedron is planning to test both the 2% TS pre-gravity belt thickened and the 6% TS gravity belt thickened material in two separate tests in succession. Both streams will be tested in the initial testing phase completed in Sedro-Woolley, with the stream that performs best as the proposed biosolids stream to be processed for the final test in Bellingham.

Decreasing Polymer Concentration in Pre-Belt Thickener

In advance of the test unit modifications, Sedron may need a 5-gallon sample of both the 2% TS pre-gravity belt thickened and 6% TS gravity belt thickened biosolids streams to do some initial testing. If

Sedron does complete this 5-gallon sample test, Sedron will share results from the test with any other companies participating in the project after all pilot tests have been completed.

Based on the results of these tests, Sedron may propose a reduction in the amount of polymer added to the pre-belt thickener for when the test is being conducted for optimal performance of the test unit.

Clean Up & Removal of Test Unit

Following the completion of the pilot testing on-site in Bellingham, the Varcor test unit will be disconnected and removed by the Sedron team. Any equipment or trash created by the Sedron team will be removed from the site at the time of the site breakdown. We propose that all byproducts produced from the Varcor test unit while onsite in Bellingham will be disposed of by the Bellingham WWTP. Byproducts include the dry biosolids, aqueous ammonia, and water.

City of Bellingham Business Registration

Sedron understands its obligation and agrees to obtain and maintain a City of Bellingham business registration as a requirement for performing these services/work.

PROPOSED SCHEDULE

Sedron is proposing that the testing is carried out over 26 weeks as detailed below. Approximately 10 of those weeks would be onsite at Bellingham's WWTP. This approach allows for thorough testing, while reducing onsite disruptions in Bellingham.

Any modifications required for the test unit would be completed post-project award, but prior to the project kick-off.

Sedron requests to kick off the project around April of 2024, to ensure the work can be done prior to winter weather and freezing conditions. As this test is planned to happen outside, Sedron would strongly prefer to not have the team running the test in the winter.

	Week Number																								
Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Project Kick Off	◆																									
Initial Testing in Sedro-Woolley											◆															
Ship Unit to Bellingham												◆														
Installation													◆													
Pre-Acceptance Testing																			◆							
Final Acceptance Testing																					◆					
Teardown																						◆				
Final Report Generation																										◆

PROPOSED TECHNICAL APPROACH

HISTORY OF THE VARCOR & THE TEST UNIT

The history of the Varcor began in earnest in 2017, when multiple small-scale prototypes were built, and testing began on dairy manure. These prototypes verified the technology was able to remove ammonia and other low-boiling point constituents from the waste stream and verified heat transfer values. In 2018, a miniature Varcor was designed and built to facilitate the engineering of the full-scale system. This is referred to as Generation 0 or "the test rig". Tremendous learnings were gained from this system and were incorporated into future systems. The processing rate for the test rig was 2 gallons per minute.

After several years of lab research and building prototypes in Sedro-Woolley, WA, we reached an agreement with an organic dairy farm in Hartley, TX to install the first full size Varcor on-site to process the manure from 4,000 milking cows. This Varcor (V1) system was built in 2018 and deployed as an R&D unit in 2019. This system was used 75% of the time for R&D and 25% for production. It enabled us to test and optimize many of the features and functions of the Varcor in a

production environment, and the learnings from this deployment were incorporated in the next generation Varcor.

In 2020, a second Varcor "test unit" was built specifically for the purpose of validating the ability of the Varcor to process waste streams from the distilling industry. It was engineered so that it could test waste streams from all industries in recognition of the value for our customers of conducting small trials before committing to a full-size Varcor deployment. The test unit was first deployed at a rum distillery in the Caribbean to test the feasibility of processing vinasse as a byproduct of the distilling process. The test unit is much smaller than a full-size Varcor unit, but it uses the exact same processing techniques and technology as a full-size Varcor. The primary difference between the test unit and a full-size Varcor is processing speed and size. This test unit processes influent at rate ranging from .35 to .50 gpm, and it is small enough to fit into several standard shipping containers for transportation. This is the test unit that we propose using to complete the pilot project for the City of Bellingham.

Varcor Test Unit Processing Vinasse in the Caribbean

The second generation full-size Varcor (V2) system was deployed on an organic dairy farm in Northern Indiana in 2020. Unlike the previous installation, this system was used 75% for production and 25% for R&D. Several upgrades and modifications were made that improved energy efficiency, processing speed, and the quality of the dried fertilizer product it produced. This Varcor (V2) produced clean water that was used for irrigation on the farm, as well as a balanced dry organic fertilizer that was land-applied on the farm's croplands. It also stripped the ammonia from the manure and captured it for use as an additional, nitrogen-rich liquid fertilizer on the host farm.

The third generation full-size Varcor (V3) system was deployed in November 2022 in Sumner, WA to process human waste pumped from septic tanks and Class B biosolids from wastewater treatment facilities. This system has been in operation for 11 months and has processed over 12 million gallons of waste material. This system is a 100% commercially operational system. This model incorporates design improvements from V1 and V2 and has processed waste at a rate of up to 105 gpm, with a nominal processing rate over time of 90 gpm.

Sumner Septage and Biosolids Processing Site

Sumner Varcor

We have several Varcor projects around the United States that are in the proposal/contracting phase, and three Varcor (V4) sites that are currently in active development. Those three projects are:

- A 5-Varcor site on dairy farm in Northern Indiana that is projected to begin processing digested cow manure in the Spring of 2024. The Varcor units deployed on this site will be Fourth Generation Varcors (V4). The building is complete, and process equipment is being installed with the first Varcors, which are currently being delivered and commissioned.

Varcor Building at a Dairy Farm in Northern Indiana

- A 3-Varcor (V4) site on a dairy farm in Wisconsin that is projected to begin processing digested cow manure in the Fall of 2024. Construction of the building is underway and is 30% complete. The first Varcor will be delivered in Summer 2024.

Building Under Construction at a Varcor Site on Dairy Farm in Wisconsin

- A 4-Varcor (V4) site at another dairy farm in Northern Indiana is on track to be under contract Q2 of 2024. At this point we do not have an architectural rendering of that site, but it is very likely that the design and layout will look like the other project in Northern Indiana that was mentioned above.

HOW THE VARCOR WORKS

Sedron's Varcor technology is a unique solution that quickly and efficiently converts liquid slurry waste streams into valuable products and clean water. In a wastewater application, the Varcor

converts thickened sludge into Class A biosolids for land application (assuming the incoming sludge allows the end-product to meet the necessary ceiling concentration limits under 40 CFR Part 503) at sites such as Boulder Park, WA, and renewable solid fuel in cement kilns. As noted above, it will also produce distilled reclaimed water that is suitable for non-potable reuse.

Inputs to the Varcor

At Post Point, the only influents to the Varcor will be thickened sludge and some process water. The liquid component of the sludge will consist of water and low-boiling point constituents such as ammonia and other compounds. Sedron understands that this input material may vary in composition and solids content over time. We anticipate the thickened sludge will typically exit the Post Point system at roughly 75° C before entering the Varcor via a pump or tote.

Process Overview

The Varcor system is a continuous process for full-scale operations. During demonstration, continuous operations is preferred, but batch mode is optional. Inside the Varcor system the thickened sludge will be heated to ~100° C and then applied to rotating steel disks that have been heated to 110° C. As the disks rotate, the solids component of sludge dries into a thin film which it is scraped off with geometries identical to our full-scale Varcor and collected to become Class A biosolids. The most distinctive aspect of the technology in comparison with others is the physical format which consists of multiple hollow steel discs on a rotating horizontal spindle, with the outside of the discs providing a large, heated surface area for evaporation of the liquid, with the inside of the discs and spindle providing a conduit for process fluids. This configuration results in a sizeable effective surface area in a relatively compact volume and a convenient means of cleaning the evaporative surface as the spindle rotates.

A major operations challenge for most solids processing technologies is material handling during the sticky phase of dewatered sludge. The Varcor avoids the sticky phase altogether, dramatically reducing a leading cause of downtime. The Varcor is an electro-mechanical process that avoids the downtime from the inherent challenges of maintaining system stability for biological processes like anaerobic digestion, and thermochemical processes like gasification.

Mechanical Vapor Recompression, Evaporation & Distillation

The Varcor process employs mechanical vapor recompression (MVR) for energy efficiency in the drying process and unlike common drying methods, predominantly uses electricity as the energy source. Sedron's Varcor solution is an evaporative drying process designed to dry a variety of slurries that can process material with solids content ranging from 1% to 20% to a final dry solids content of approximately 90%.

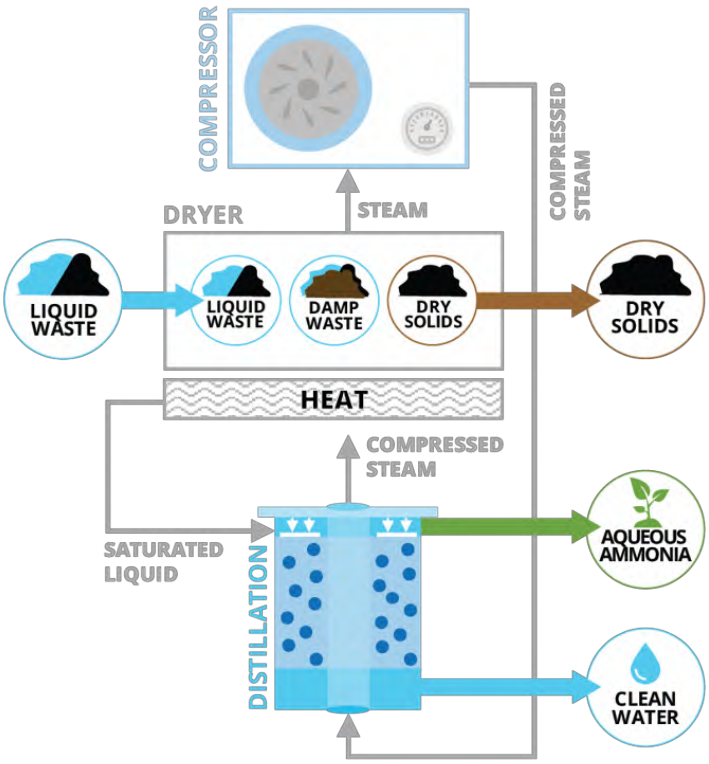
The Varcor is modular in design and can be scaled to applications by adjusting the number of modules. Experience gained through years of development and problem-solving at scale on a single-module Varcor installation at an organic dairy farm in Indiana has created a high degree of confidence in the 4th generation systems that will be installed in Bellingham.

Sedron's state-of-the-art manufacturing facility in Bellingham incorporates techniques such as robotic welding to achieve the demanding tolerances required for high-volume fabrication of ultra-flat surfaces.

Sedron's Robotic Weld Cell Located in Bellingham

Full-scale Varcor systems are modular in design with a standard module having an effective processing rate of up to 105 gpm, with a nominal processing rate over time of 90 gpm. The design is based on pre-plumbed and prewired process skids that require a minimum of onsite assembly and installation. The Varcor design has evolved considerably with a variety of improvements made in response to conditions observed during full-scale operation on the Varcors in Texas, Indiana, and Washington.

The fundamental process is illustrated in the figure below. A wet (flowing) pre-heated and degassed slurry is fed into a horizontal dryer assembly that spreads the slurry onto a slowly rotating hot solid metal surface which evaporates the water from the slurry. The vapor from the evaporation is drawn into a steam compressor and is pressurized to approximately 1.5 bar and 115° C. This compressed steam is returned to the (inner) non-contact side of the evaporative surface, providing energy for evaporation as this compressed steam condenses. In this transition, the latent heat of evaporation is recovered, allowing the evaporation to occur with a relatively small net energy expenditure.



Varcor Process Diagram

The figure above illustrates the process flow in more detail. The vapor from all discs is collected and drawn through a plenum into the suction side of a vapor compressor, which returns the compressed, heated vapor as saturated steam to the inside of the discs through the spindle assembly. The solids scraped off both sides of all the discs fall by gravity into a heated collection system that transports the solids mechanically, through a conveyor system, to a storage bin or directly into trailers for shipment off-site.

Steam condenses inside the discs as heat is transferred to the slurry on the outside surfaces of the disc. The resulting hot condensate travels through the spindle and is passed through a distillate recovery system and simultaneously transfers heat to the incoming slurry in the preheat exchanger before being discharged as a distilled reclaimed water product.

A small percentage of the steam inside the discs, along with low boiling constituents that have been stripped from the condensate and concentrated into this vapor, will leave the spindle and enter the recovery system. The distillate is sent to a storage tank for disposal at Sedron Technologies' expense. The remaining water vapor is further condensed to add to the condensate production. Lastly, non-condensable gases are expelled through a biofilter or other appropriate control technology.

PROPOSED BELLINGHAM TEST

Test Unit Modifications

Sedron has designed the test unit to process a wide variety of waste streams from multiple industries. While the test unit is currently fully operational, Sedron is planning on making some additional modifications to the machine to fully optimize the capability of the Varcor test unit to process Bellingham's specific waste streams. The test unit was fabricated to show the high-level functions of the Varcor, mechanical vapor recompression and thin film drying. With modifications to the dryer and the addition of more stringent odor control, the test unit will produce comparable byproducts to those produced by a full-scale Varcor with a significantly reduced flow rate.

Set Up & Initial Testing

The test unit is already set up in Sedro-Woolley and has just finished processing material from two other prospective customers. Upon project award, the team will immediately purchase materials required for the modifications we will make to the Varcor test unit for Bellingham's application and will finalize a detailed project plan.

Test Unit Set Up in Sedro-Woolley

Once the City of Bellingham is ready to start the test in Sedro-Woolley, Sedron will arrange for and manage the delivery of the first shipment (and subsequent shipments) of biosolids from Bellingham's facility.

Set Up & Commissioning in Bellingham

The test unit was designed to easily be transferred to off-site locations and therefore is small enough to be easily disassembled and placed in shipping containers. With the distance being so close between sites, Sedron will take responsibility of shipping the unit from Sedro-Woolley to Bellingham and setting it up onsite in the agreed upon location of the test. Sedron will provide a forklift and operator onsite to unload the unit.

It's proposed that the City of Bellingham will route electrical to the test unit, with the City of Bellingham making the 200-amp, 480 V, 3-phase power connection by their certified electrician. The system was designed to operate as plug-and-play and it takes less than a day for the final connection to be made for the system. The connection to the machine is around knee-height and if possible, the connection will be hung from above the Varcor to reduce tripping hazards around the machine. It should be noted that a full-scale Varcor unit requires natural gas, however the test unit was designed to only require electricity.

Cooled condensate coming from the Varcor is planned to be routed into the sewer onsite to be recirculated through the City of Bellingham's WWTP. Water coming out of the Varcor is clean enough to go back through the sewer, and on some full-scale units in development, the clean water coming out of the Varcor will be discharged directly into streams with the required NPDES permits. A water connection will be needed in case the Varcor needs to be flushed with water to clear the system.

Once the test unit is set up, sludge will be pumped into a 60 gallon in-feed tank on the test unit. The in-feed tank will be replenished via gravity-feeding from the 300-gallon stainless steel tote Sedron uses to store material. Sedron expects that about every 16 hours, the steel tote will need to be refilled with material. A Sedron-provided forklift will be needed for this about twice a day to lift the 300-gallon tote up on a stand. We kindly request Bellingham's confirmation that you can provide 300 gallons of testing material every 16 hours.

Depending on the time of year that the test happens, Sedron may choose to provide a tent at our expense to cover a portion of the machine to shield employees from the weather. The unit itself does not require any coverage from the elements.

At the start of the commissioning phase, Sedron will have provisions in place for spills and protocol in place for emergencies, including an e-stop on the Varcor.

Onsite Testing

Once the test unit is fully set up and commissioned in Bellingham, a period of onsite testing will be completed per the proposed schedule prior to the Final Acceptance Test commencing. While there will have already been a lot of testing completed on this material in the initial testing phase in Sedro-Woolley, the team will spend this onsite testing perfecting the test and making small modifications to learn as much as possible about how Bellingham's biosolids work with the Varcor.

The Varcor test unit is roughly 40' x 12' x 20'. The Sedron team will need additional area surrounding the test unit to ensure adequate space for operations (including forklifts moving totes to and from the test unit). The Sedron team did not see any issues with the proposed Bellingham location sites.

Final Acceptance Test & Teardown

The Final Acceptance Test (FAT) is proposed to start the last 2 weeks of the testing when both Sedron and the City of Bellingham are ready. The test is planned to begin on a Monday morning, and continue for five days, 24-hours a day and will be staffed with Sedron employees the entire time. The test is proposed to process only one of the two materials processed through the Varcor in the initial Sedro-Woolley testing, likely the 6% TS material.

Once the City of Bellingham and Sedron agree that the FAT has been completed, Sedron will remove the test unit from Bellingham's site early the following week, including any trash or ancillary equipment brought onsite by the team.

Final Report

A final report of the findings of the test will be compiled into a document and provided to the City of Bellingham. Key deliverables the City of Bellingham would like to see in this report will be discussed and agreed upon during the project kick off meeting. A key focus of this report will be recommendations on how to translate learnings from the pilot into a long term, sustainable solution that will positively impact operations and results at the Post Point processing facility for years to come. We will closely with key stakeholders from the City of Bellingham in developing those recommendations.

FINAL PRODUCTS

The Varcor separates incoming the slurry into three constituent components: dry Class A solids, aqueous ammonia, and distilled water. Each will be discussed for the demonstration phase and full-scale phase below.

Varcor Byproducts (left to right): Dry Solids, Distilled Water, and Aqueous Ammonia

During the piloting phase, Sedron will demonstrate that the dried solids produced by the Varcor meet the time and temperature requirements to meet Class A standards, including consistent production of 90% dry solids. During piloting, all dried solids will be returned to Post Point for disposal after testing and validation.

If Sedron is awarded the contract for full-scale production, Sedron will be responsible for off-take of the dried product. Incoming levels of heavy metals will determine whether the end-product meets the necessary ceiling concentration limits application under 40 CFR Part 503 for land application. Tests completed by Sedron at our Sumner, WA site have shown that everything processed so far qualifies for land application. If land application is possible, hauling distances will be minimized to reduce costs and greenhouse gas emissions by dramatically decreasing the amount of water contained in the dry solids material. For all projects, including this one, Sedron is actively working with national fertilizer wholesalers to develop and execute off-take contracts.

While it's understood that PFAS testing has developed significantly over the years, the PFAS testing Sedron has completed so far has shown that all PFAS is concentrated in the dry product. Sedron is in active discussions with cement kiln operators regarding the potential for the dried solids to be used as a renewable solid fuel. This outlet would address the potential need for destruction of PFAS and emerging contaminants over the life of the full-scale project as well as displace the use of fossil fuels that are currently being used in the cement industry and other similar industries. Sedron's long-term vision is to ultimately build and operate our own biosolids fueled renewable power plants. Sedron anticipates the complete destruction of PFAS through our power generation process.

During the piloting phase, Sedron will also produce small volumes of concentrated ammonia. During piloting, all ammonia products will be returned to Post Point for disposal after testing and validation.

For the full-scale phase, Sedron would produce concentrated ammonia at scale, which will translate to a reduction in the need for nitrogen removal at Post Point. The Varcor is unique in that it includes not only dewatering and drying, but also nitrogen removal with no side stream returned to Post Point. Many solids processing technologies that could be used during the full-scale phase would require side

stream nitrogen removal. According to Technical Memorandum No. 20, the avoided cost of side stream nitrogen removal to Post Point is $19-21M compared to these other technologies. At full-scale, Sedron will develop local markets for this material as an ammonia-based nitrogen fertilizer when possible and provide proper disposal of any that cannot be beneficially used.

During the piloting phase and full-scale phase, Sedron will separate the solids and low boiling-point constituents to produce clean water through distillation. During both phases, this water will be returned to Post Point via a sewer drain unless there is an on-site demand for reclaimed water for a specific application.

PROPOSED FEES & COSTS

Sedron understands the City of Bellingham's thoroughness in ensuring the best possible solution for the biosolids produced from the Bellingham WWTP is selected. With this in mind, Sedron has proposed a detailed testing approach, that goes beyond previous tests completed for other customers. Sedron has successfully processed biosolids from multiple WWTPs in our full-scale Varcor in Sumner, WA, and we are confident that the biosolids from the Bellingham WWTP will follow the other successful results.

If this approach is too thorough for what the City of Bellingham is looking for, a **revised proposal can be submitted with modifications** that will reduce the complexity and cost of the pilot to ensure award. Sedron is completely dedicated to this project with Bellingham being a close neighbor and is confident that Sedron can demonstrate a sound biosolids solution with cost and environmental benefits.

With the Bellingham WWTP's location being so close to Sedron's facilities, no hotels or per diem are required and as such, are not included in the pricing of this proposal.

This proposal includes the following:

- All mechanical modifications to the test unit to process biosolids,
- Engineering design and procurement of materials for test unit modifications,
- Engineering and technician labor for implementation of test unit modifications,
- Experienced project management including a dedicated Lead Engineer and an experienced Project Lead from our business development team,
- Set up and commissioning of the test unit across both locations,
- Shipping costs and any logistics associated with shipping,
- Site cleanup,
- Transfer of biosolids to Sedro-Woolley at Sedron's expense, and
- Compilation of final report.

To show Sedron's commitment to a full-scale Varcor solution for the City of Bellingham, the full cost of the proposed pilot will be credited to the City of Bellingham should Sedron Technologies be awarded a contract for implementation of a full-scale Varcor solution within 3 years of the completion of the pilot project. Once earned, the credit will be applied as a $259,000 reduction in the annual cost of the full-scale deployment for each of the first five years of the project ($259,000 x 5 = $1,295,000).

Bellingham Solids RFP Pricing		
One-time Payment for All Services Indicated in this Proposal, payable as 50% upon award and 50% upon Final Acceptance Testing	$	1,295,000

The pricing provided above is a comprehensive proposal that meets all requirements for this RFP. Sedron is also happy to provide a lower-cost option with a price of $1,045,000 that would deliver all of the same outcomes except for locating the test unit on Bellingham's Post Point facility. For this option, we would do all testing in Sedro-Woolley, WA.

REFERENCES

To maintain compliance with our confidentiality agreements with our conglomerate, we can provide complete reference contact information upon request. The following are references Sedron has worked closely with on projects in the last four years:

- ***John Dannan – Managing Director & Head of Waste Investments, Generate Capital***
  - Phone: 917-601-7169
  - Email: john@generatecapital.com
  - Projects: 1 Varcor Regional Biosolids Site, Sumner, WA & 5 Varcor Dairy Site, Fair Oaks, IN
- ***Bob Hickey – Consultant, Representing Multi-National Liquor Company***
  - Phone: available upon request
  - Email: bhickeyllc3@gmail.com
  - Project: Pilot Varcor unit created for this company, operated in the Virgin Islands at a rum distillery
- ***Donald DeJong – CEO, Natural Prairie Dairy***
  - Phone: available upon request
  - Email: available upon request
  - Projects: 1 Varcor Dairy Site, Hartley, TX & 1 Varcor Dairy Site, Lake Village, IN
- ***Mike McCloskey – Co-Founder, Curtis Creek Dairy***
  - Phone: available upon request
  - Email: available upon request
  - Project: 5 Varcor Dairy Site (in development), Fair Oaks, IN

CONTRACTUAL ARRANGEMENT

TYPE OF CONTRACT & CONTRACT TERM

Sedron is proposing this contract is an agreement for services. Sedron typically deploys our Varcor solution under a Design-Build-Own-Operate-Maintain (DBOOM) model that requires minimal up-front investment from customers. The proposed contract term for the pilot unit is 6 months.

Should this translation into a relationship with Sedron and the City of Bellingham for a full-scale Varcor solution, Sedron would provide all the staff to operate the facilities, cover all operating costs, cover all expenses associated with the design and construction of the facilities (permitting, groundwork, building construction, Varcor systems, etc.), and any on-going maintenance including spare parts required. The only operating expense for the City of Bellingham for a full-scale solution would be an agreed upon monthly processing fee. The Varcor is designed and manufactured to support a 20-year lifespan. Contract terms have historically been proposed and implemented as a 20-year contract.

MERCHANT SOLUTIONS

The Varcor solution proposed herein is not unique to the City of Bellingham nor is it part of a larger regional solution. The Varcor test unit was engineered to process multiple waste streams and determine the viability of upcycling the nutrients in an energy efficient and environmentally friendly way. No intellectual property, including patents, copyrights, trademarks, industrial designs, or trade secrets have been uniquely developed for the proposed pilot project for the City of Bellingham.

ADDITIONAL INFORMATION

ESG & NUTRIENT POLLUTION BENEFITS

In addition to being a single-step and economically feasible solution, the Varcor system brings the following key sustainability aspects:

- **Energy Savings & Environmental Impact**: Sedron is committed to protecting and restoring the environment. By evaporating water with our thin-film drying technology and using mechanical vapor recompression, our technology uses 1/30th of the energy that a natural gas boiler would need to achieve the same results. That equates to lower greenhouse gas emissions and a reduced reliance on fossil fuels.
- **No Nitrogen Sidestream Return to Post Point:** Sedron is unique in providing nitrogen removal with no sidestream returned to Post Point, saving the City an estimated $19-21M in capex (Technical Memorandum No. 20) required by many solids processing technologies for the full-scale phase.
- **Reduced Staffing Requirements:** Sedron would reduce the challenges and costs of increasing staffing during the full-scale phase by providing all necessary operators. Technical Memorandum No. 23 estimates that an additional 5-6 staff will be needed at Post Point to operate new biosolids equipment and nutrient removal equipment.
- **No Sticky Phase:** A major operations challenge for most solids processing technologies is material handling during the sticky phase of dewatered sludge. The Varcor avoids the sticky phase altogether, dramatically reducing a leading cause of downtime.
- **No Complications from Biological or Thermochemical Processes:** The Varcor is an electro-mechanical process that avoids the downtime from the inherent challenges of maintaining system stability for biological processes like anaerobic digestion, and thermochemical processes like gasification.
- **Reduced CO_2 Emissions:** The City's 2018 Climate Action Plan has the ambitious goal of reducing sewer utility CO_2 emissions by 60-80%, and the Varcor will help the city meet these goals in several ways:
    - The Varcor avoids the need for dewatering, an energy-intensive step in wastewater treatment.
    - The Varcor avoids the need for costly polymer, the operator attention required for dosing it, and the GHG emissions from manufacturing and transportation.
    - Mechanical Vapor Recompression (MVR) is 30 times more energy efficient than traditional drying and utilizes electricity that can come from renewable energy with minimal need for fossil fuel such as natural gas, positively impacting the local community.

At Sedron Technologies, we are committed to being a good neighbor to the communities we serve. This means doing everything in our power to ensure that everything we do is for the good of the community and does not create an unfavorable experience for anyone. That can be as simple as making sure our trucks don't track material onto the local streets, or as complex as designing a solution in a way that minimizes unpleasant odors. No one wants to live or work near a facility that creates an unpleasant environment in the surrounding area. As such, we have dedicated ourselves to taking all necessary precautions to prevent any odors generated by the Varcor Test Unit or a full-scale Varcor from adversely affecting the neighboring community.

We will deploy the latest odor mitigation technology on the Varcor Test Unit and will constantly monitor the area for any odors that may be considered offensive. In addition to monitoring, we will deploy all necessary technology to prevent any odors from leaving the immediate vicinity of the Varcor test unit while deployed at The City of Bellingham's Post Point facility. We will employ operating practices designed with odor prevention in mind and will immediately address any issues that present themselves.

Our solution will create stable jobs with attractive wages, benefits and upward mobility for members of the community. Many of our current employees are graduates of Western Washington University, Whatcom Community College, and other local educational institutions. In addition, we have attracted many highly educated, productive employees and their families from outside the region to Whatcom and Skagit counties. We have a world-class laser weld cell manufacturing facility located in Bellingham, as well as satellite office to give our Bellingham employees a local workplace and a shorter commute.

CLOSING COMMENTS

Thank you again for the opportunity to present our proposed solution for a test pilot that will meet your solids handling needs. We are confident that there is no more effective solution than a Varcor for both the pilot test and for full scale implementation. There is a certain comfort that comes from doing business with a local company like Sedron Technologies, where you know that your investment will be plowed back into the local community, creating jobs and opportunity for Whatcom and Skagit county residents.

Even more satisfying is the fact that in addition to supporting local residents, you are also investing in a world-class technology that will eventually change the world by reducing greenhouse gas emissions, facilitating the beneficial reuse of material that not long ago was considered waste, and allows for the most economical use of your operating and capital budgets. Sedron Technologies is delivering massive change for the betterment of the planet in the wastewater, dairy, and distilling industries, and we'd love to have The City of Bellingham be part of the movement.

We look forward to partnering with you to create a brighter and more sustainable future for all of us!