



SUSTAINABILITY REPORT  
2021

BUILDING INNOVATION FOR GENERATIONS



---

# TABLE OF CONTENTS

<b>MESSAGE FROM THE CEO</b>	<b>2</b>
<b>MATERIAL TOPICS</b>	<b>3</b>
<b>ENVIRONMENT</b>	<b>4</b>
PROTECTING THE AQUIFER	5
PROTECTING THE LAND	11
REDUCED LAND DISTURBANCE AND PROGRESSIVE RECLAMATION	14
REDUCING EMISSIONS	16
ENERGY CONSUMPTION USING RENEWABLE POWER	18
<b>SOCIAL</b>	<b>20</b>
COMMUNITY ENGAGEMENT	21
COMMUNITY INVESTMENT AND DEVELOPMENT	22
INDIGENOUS ENGAGEMENT AND RELATIONSHIP BUILDING	23
<b>GOVERNANCE</b>	<b>24</b>
LEADING THROUGH INNOVATION	25
NEW PARTNERSHIPS	25
COMMITMENT TO SAFETY	26
<b>VISION AND COMMITMENTS</b>	<b>27</b>
<b>IN MEMORIUM</b>	<b>28</b>

# MESSAGE FROM THE CEO

We are proud to share our second Sustainability Report in as many years, highlighting our achievements and demonstrating our ongoing commitments to our investors, staff and communities where we work, live and play. Sustainability is a core value for our company and our people, not just doing the right thing for people and planet but leading the way in innovation and technology that ensures we are having the least impact with the greatest benefits for generations.

We are immensely proud and grateful for the opportunity to operate and support community development and growth in Manitoba, and to work with our partners in industry, government and community. Our goal is to be environmental stewards and industry leaders, to create opportunities for employment and collaboration, and to advance manufacturing technologies that align with the global goal for decarbonization by electrifying the world through cleaner, more sustainable, energy sources that better the lives of people around the world.

Our sand deposit is one of, if not the largest, high purity silica resource in the world. This uniquely positions Sio Silica Corporation to successfully deliver the global supply needs for leading-edge technology, focused on renewable and clean energy markets with our green silica products.

Our mine is not a traditional one, there are no open pits, and we have an exceptionally small footprint. Furthermore, we are proud of our innovative technology that greatly reduces our water consumption and we've designed our operations to significantly reduce transportation requirements. We had anticipated breaking ground on our Vivian Sand Project in 2021, however, with the impacts of Covid-19 creating delays in our permitting and approval process we now anticipate having our operations start in 2023.

This report is a continuation of our story and what we shared in our 2020 Sustainability Report, building on a foundation of experience, operational excellence, and a vision for the future. We will continue to work with our leadership, stakeholders,



rightsholders, and communities to demonstrate our ESG commitments and priorities. As we prepare to break ground on our Vivian Sand Project we are preparing our baseline metrics and data to support a full ESG report, applying global reporting standards including the Global Reporting Index (GRI) and Sustainability Accounting Standards Board (SASB) metrics.

In this report, as we did in our inaugural one, we have shown our alignment with selected United Nations Sustainable Development Goals (SDGs).

Feisal Somji  
President & Chief Executive Officer, Founding Director  
Sio Silica Corporation

# MATERIAL TOPICS

Sio understands that our operations have direct and indirect impacts on various economic, environmental, and societal topics and we must position ourselves to address them, ensuring positive contributions.

Applying GRI & SASB metrics for our industry, Sio's Executive team completed a materiality assessment to identify and understand our crucial ESG risks and priorities. Key audiences for this assessment include investors, employees, communities where we work, Indigenous communities, customers, suppliers, contractors, government, NGOs and potential future partners.

By focusing on the material topics that present the greatest opportunities and risks to our company, the environment, or

communities, it allows us to develop strategies that leverage opportunities and mitigate risks, ensuring our long-term growth, sustainability, and resilience. These topics have been used to inform the development of this report and future reporting and will be embedded into our Strategic plan.

Sio acknowledges that these ESG topics can change over time and commits to re-evaluating these topics during the preparation of our annual reportings.

## CRITICAL ESG RISKS AND PRIORITIES

		
<p><b>ENVIRONMENTAL</b></p> <ul style="list-style-type: none"> <li>Water Quantity &amp; Quality</li> <li>Air Emissions</li> <li>Closure and Rehabilitation</li> <li>Biodiversity / Ecology</li> <li>Environmental Compliance</li> </ul>	<p><b>SOCIAL</b></p> <ul style="list-style-type: none"> <li>Local Community Relations</li> <li>Market Access</li> <li>Economic Performance</li> </ul>	<p><b>GOVERNANCE</b></p> <ul style="list-style-type: none"> <li>Land and Resource Rights</li> <li>Indigenous Rights</li> <li>Public Policy</li> </ul>

# ENVIRONMENT

# PROTECTING THE AQUIFER

6 CLEAN WATER AND SANITATION



Having access to safe, clean and readily available water is crucial for socio-economic development, energy and agriculture, healthy ecosystems, and for human consumption and survival.

Sustainable Development Goal (SDG) 6 is to “Ensure availability and sustainable management of water and sanitation for all”. At Sio Silica, we recognize the local aquifers are extremely important to the communities where we operate. We understand the need to achieve the correct balance between the many competing commercial and residential demands on water resources.

Throughout a large part of south-eastern and central Manitoba, the main source of water supply for municipal, industrial, rural,

residential, and agricultural uses is groundwater from the Red River Carbonate (limestone) aquifer. A less popular source of water supply is from the Winnipeg Sandstone aquifer.

Sio's activities rely solely on the Winnipeg Sandstone aquifer with no anticipated usage of the more popular Red River Carbonate aquifer. All of our mining claims are located in areas of low to low-medium water stressed regions, according to the World Resources Institute's (WRI's) Water Risk Atlas.

## AQUIFER PROTECTION ELEMENTS



Aquifer quality and quantity monitoring before, during and after extraction activities

Water management

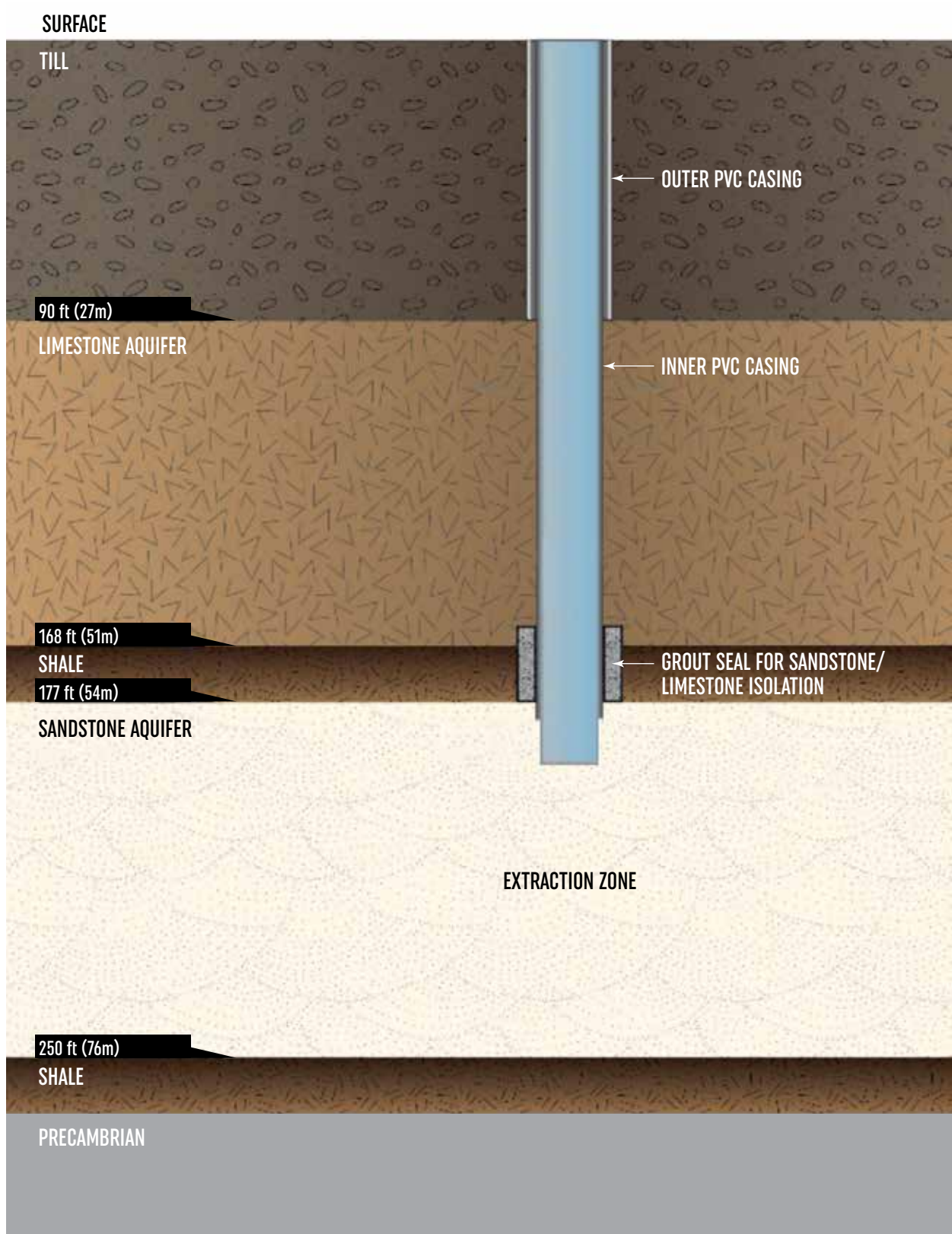
Water monitoring comprising observation wells, private wells and new monitoring wells

Establishing a safe setback between extraction wells and infrastructure (private homes, water wells, etc.)

Inspection of water wells each year in advance of extraction and following complete recovery of the aquifer

Communication platform for the community and protocols to respond to concerns

## EXAMPLE OF EXTRACTION WELL DESIGN





## Protecting the aquifer is always Sio's top priority when it comes to our operations.

To learn and assess the potential impacts and ensure safe drinking water for all, Sio undertook an extensive hydrogeology and geochemistry assessment prepared by qualified hydrogeologists and intends to implement follow-up plans and monitoring programs to ensure the watershed aquifer is protected. These include a Water Management Plan and Groundwater Monitoring and Impact Mitigation Plan.

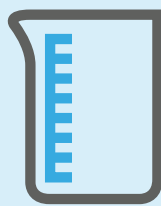
Wells will be drilled in advance of extraction activities using a water well rig and using standard industry practice water

well drilling techniques. When each well is drilled, casing will be installed and cemented in place to create a barrier between the various formation layers to prevent vertical mixing of the different aquifers present in the area of sand extraction.

Cement practices follow the requirements of *The Groundwater and Water Well Act*, creating a reliable seal between the layers of the sandstone, shale, and carbonate to prevent inter-aquifer mixing and surface contamination.



## KEY FINDINGS OF THE HYDROGEOLOGICAL AND GEOCHEMISTRY ASSESSMENT



### GROUND WATER QUANTITY

Effects on groundwater quantity anticipated to be relatively small, local, temporary and reversible.

Pump testing found negligible changes in water levels in nearby wells during pumping with complete aquifer recovery shortly after pumping stopped.



### GROUND WATER QUALITY

Naturally elevated concentrations of iron and manganese found in the groundwater today may be reduced if the groundwater is exposed to air.

Drill cuttings will be tested and disposed offsite at an approved facility if they pose a risk to groundwater and surface water quality.

Once the wells are drilled, Sio will use an extraction method that was developed using water well industry methods to extract the sand.

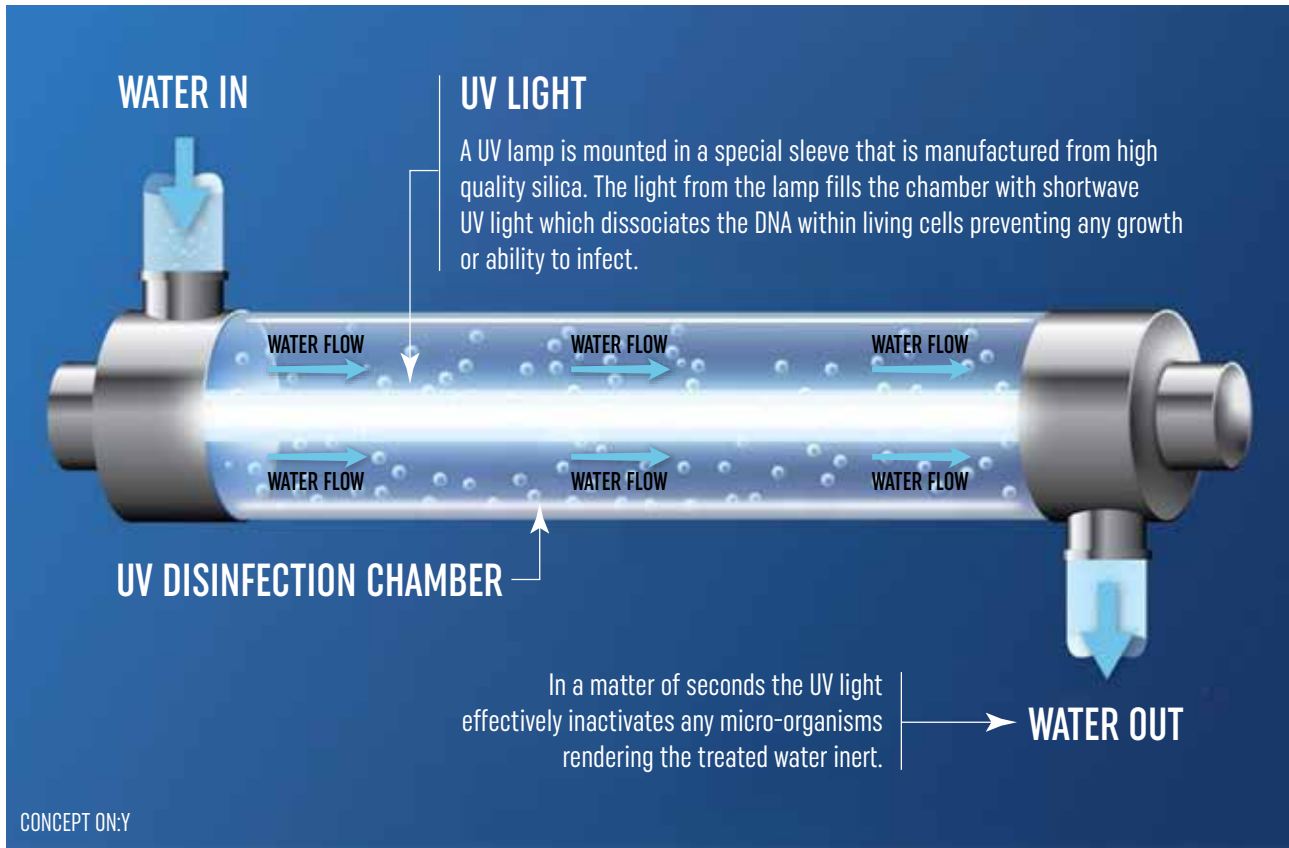
Sand will be separated from water at the surface and placed in a slurry line for transportation directly to a sand processing facility. Water that is removed from the sand on the surface at the extraction site will be filtered and treated with ultraviolet light (UV), a treatment technique commonly used in municipal water treatment facilities. Water will be returned to the aquifer while the well is producing sand. Water is returned (re-injected) by gravity, with no pressure applied at any time. Using this method allows only sand to be sent to the facility for processing, with little to no water removed from the aquifer due to extraction activities.

The slurry transport system will contain recycled water from the facility, traveling in a continuous loop. The sand enters the loop at the extraction site, travels in the slurry line to the facility and is removed from the slurry line for washing and drying.

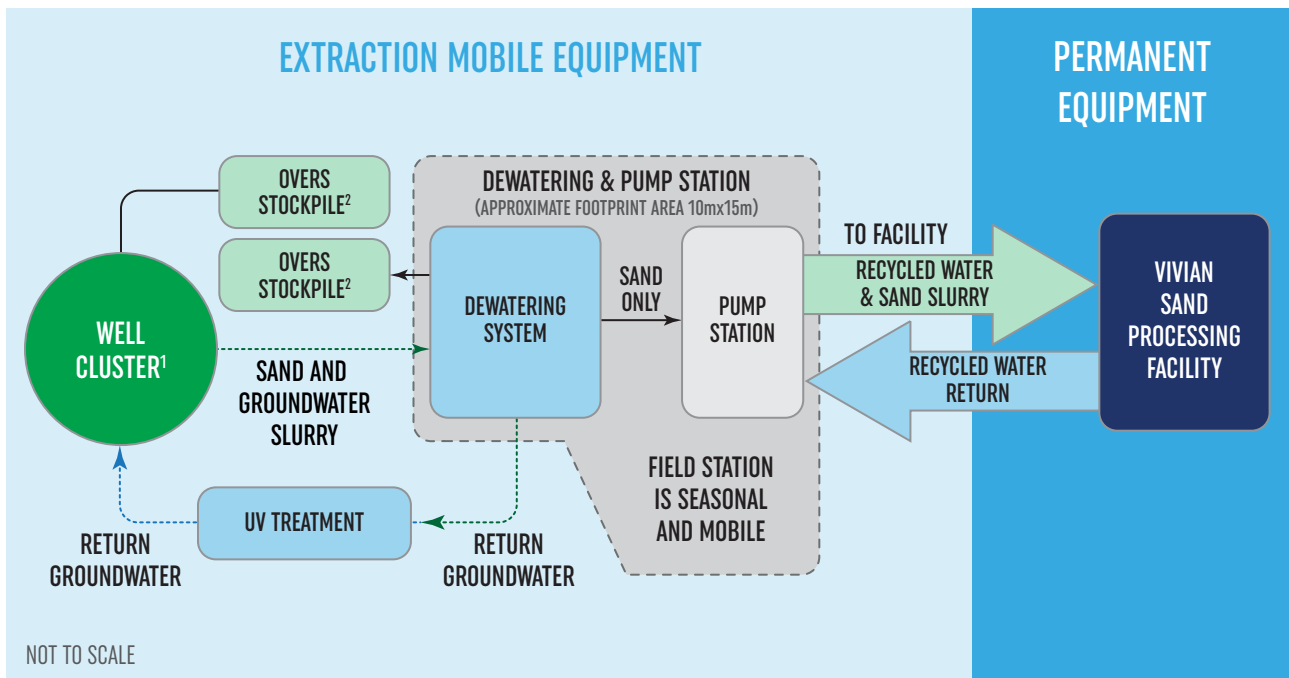
Once the water no longer contains sand and has been through the treatment process, the water is returned back to the extraction site via a dedicated water return line. This water feeds back into the sand slurry line to move more sand back to the facility in a continuous loop process.



## UV DISINFECTION PROCESS



## EXTRACTION PROCESS



1 Maximum of 5 wells in each cluster

2 The overs stockpile is stored in appropriate containment until it is removed for disposal



Sio strongly believes in protecting the aquifer and will issue a Groundwater Monitoring and Impact Mitigation Plan to the Manitoba Provincial Government prior to commencing operations, describing in detail the plans to protect existing wells in the area.

The groundwater monitoring and mitigation measures will include the following key components:

- ▶ Establishing and maintaining a safe setback between extraction wells and infrastructure (private homes, water wells, etc.).

---

- ▶ Establishing a groundwater monitoring network comprised of both provincial observation wells, private wells and new monitoring wells.

---

- ▶ Characterization and monitoring of groundwater quantity (water levels) and quality prior to, during and following operations. This will involve installation of pressure transducers to monitor water levels and collection of water quality samples. Results will be shared with owners.

---

- ▶ A thorough inspection of water wells within the predicted zone of influence each year in advance of extraction and following complete recovery of the aquifer.

---

- ▶ Monitoring of groundwater extraction and reinjection rates associated with operations.

---

- ▶ Monitoring of the water quality of reinjected water to verify treatment efficacy.

---

- ▶ Management of any materials produced by drilling to ensure they do not affect water quality in the aquifers.

---

- ▶ Communication with the community on a regular basis and establishment of a communication platform (email, phone, etc.) for the community to share any concerns with Sio. During operations Landowners will be provided with a 24 hours contact number should there be any concerns with their water at any time.

---

- ▶ A protocol for responding to any concerns. If at any time a water quality or quantity issue is detected, Sio will mitigate the issue immediately. This may require, short-term ceasing of operations, modification of extraction operations, lowering of the water pump in the well, or a temporary external supply of water.

---

- ▶ Progressive abandonment of each extraction and/or monitoring well after it has reached the end of its productive life in accordance with provincial regulations.

---

- ▶ Preparation of an annual report by a third party with qualifications in hydrogeology and geochemistry which will be made available to the public following completion of operations each year.

---

With these measures in place to monitor and protect the water in the aquifer, Sio does not anticipate material impacts.

# PROTECTING THE LAND



Sio strives to minimize land disturbance in all areas of our operations and manage development activities to reduce our impact on the environment.

Land use planning is continuously evolving to have the least amount of impact on the environment as possible, all the way from the planning stages to the decommissioning of an extraction well. When the original Vivian Sand Extraction Project was filed in July 2021, Sio Silica anticipated extracting sand as a sand and water slurry from up to 467 extraction wells per year in the Winnipeg Sandstone aquifer.

As a result of recent refinements in the project aimed at improving efficiency and minimizing the footprint, Sio has reduced the total number of wells required per year from

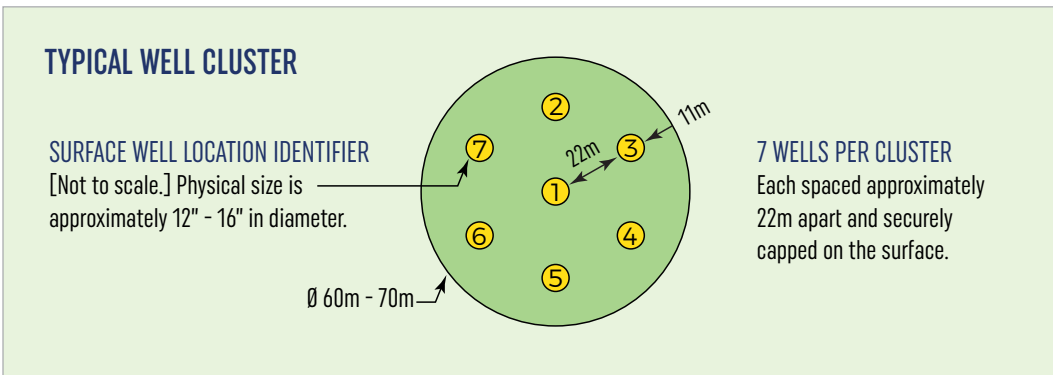
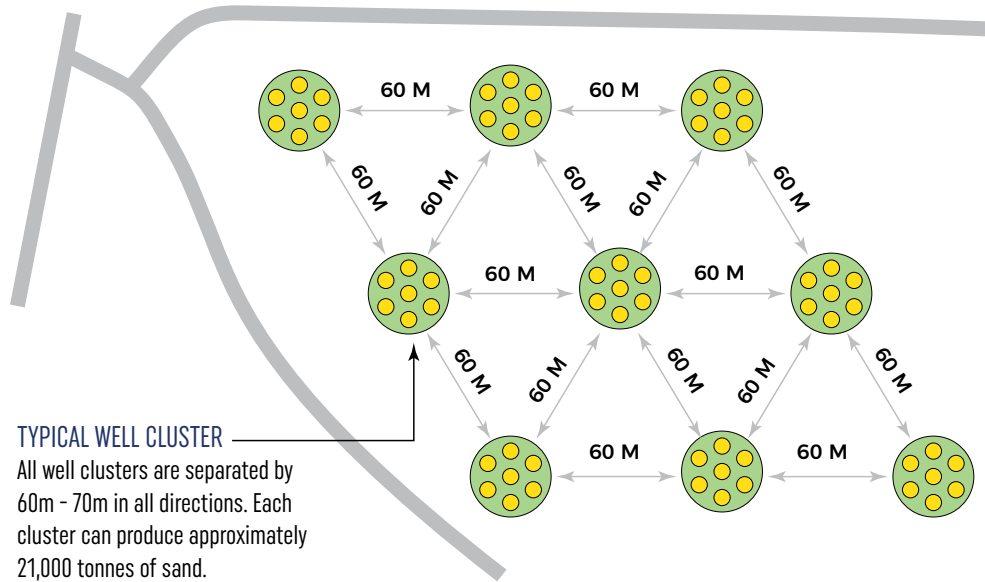
467 to 324, a 30% reduction. Operations will start with a lower number of wells (up to 280 extraction wells), with the number of extraction wells gradually increasing over the first few years of operation.

Extraction wells were initially planned to be clustered in groups of seven wells within 50-60 m diameter well cluster areas. The updated plan is to cluster the extraction wells in groups of one to five wells within a 60 m diameter well cluster area. Extraction wells will be located approximately 18m apart within these well cluster areas.

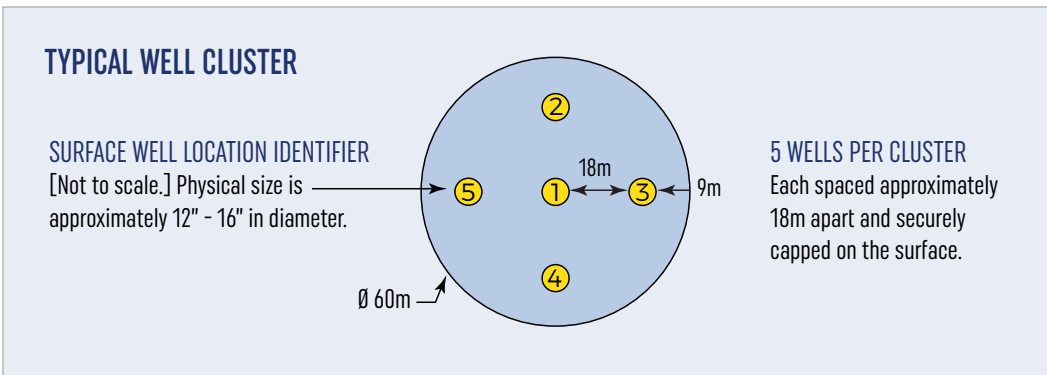
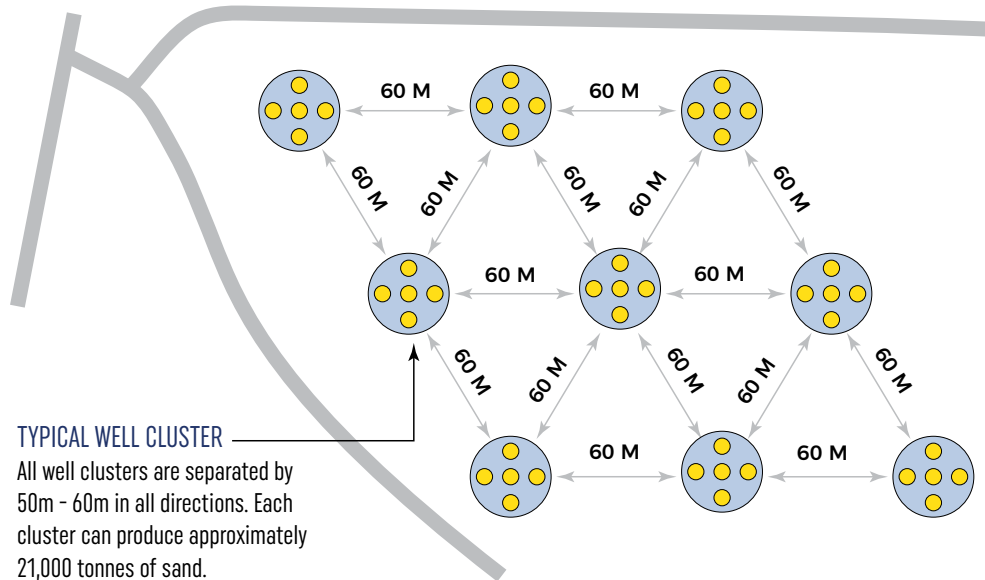
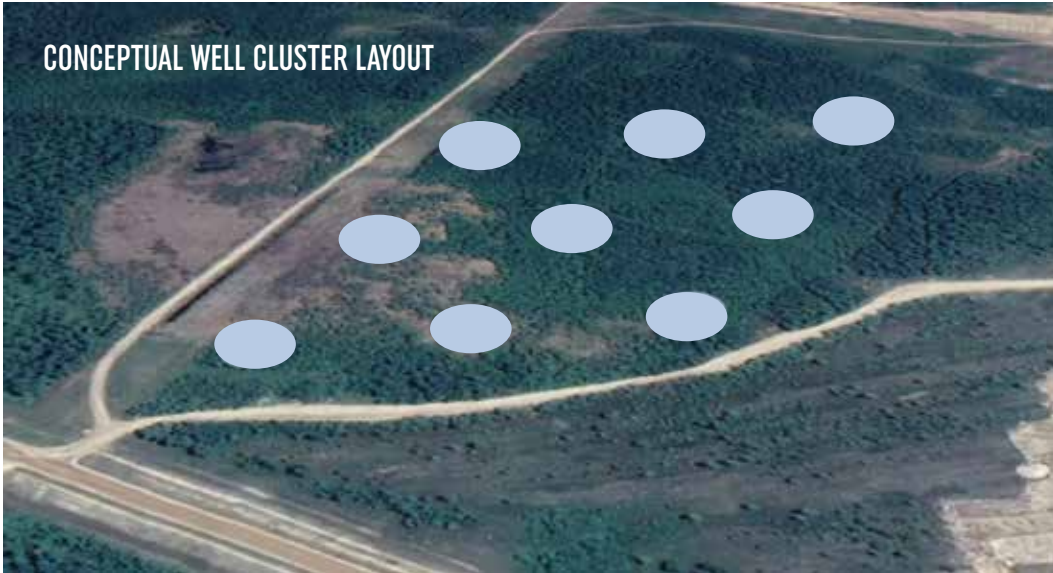
## UPDATED DRILLING CONCEPT BENEFITS

<ul style="list-style-type: none"><li>30% reduction in total number of wells required per year</li><li>Minimize footprint and improve efficiency</li><li>Reduced number of trucks on the road</li><li>Reduced emissions from drilling</li></ul>	An icon featuring a dark grey wireframe globe with a grid of latitude and longitude lines. In the foreground, there are three stylized blue leaves or petals, symbolizing environmental friendliness and sustainability.
---	--

## ORIGINAL DRILLING CONCEPT – 7 WELLS PER CLUSTER



## UPDATED DRILLING CONCEPT – 5 WELLS PER CLUSTER



# REDUCED LAND DISTURBANCE AND PROGRESSIVE RECLAMATION

Once a well is capped, all equipment will be moved to the next well in the cluster and re-connected.

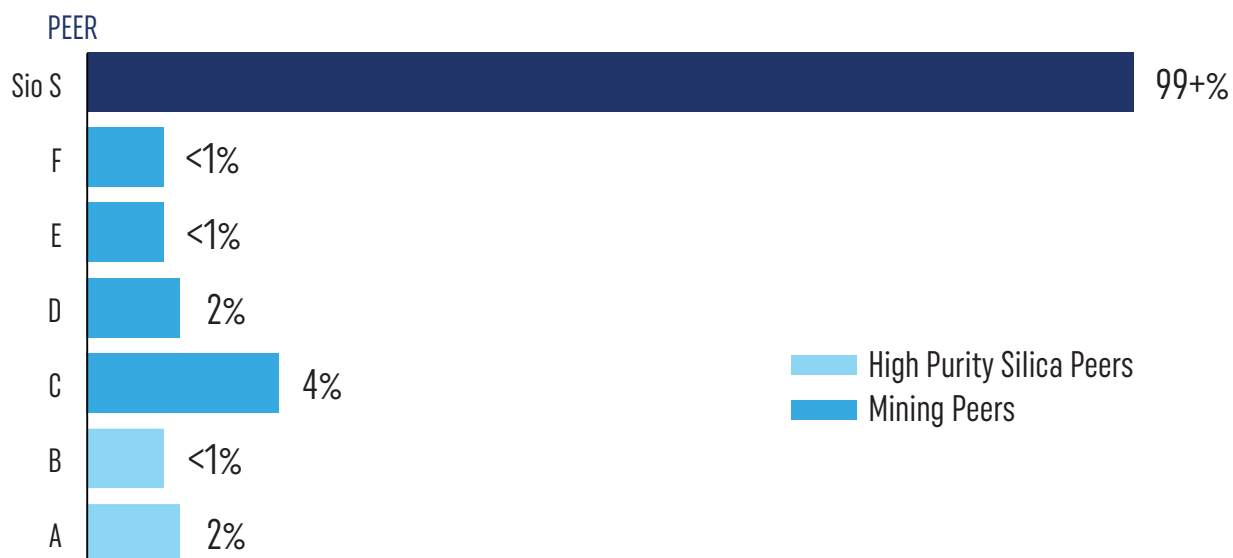
When a well is no longer producing, the production piping will be removed, the slurry line will be disconnected, and the well will be securely capped. Once the production piping is removed from the extraction well, the well will be sealed in accordance with industry standard practice that will meet or exceed the requirements of *The Groundwater and Water Well Act*, preventing movement of water vertically between the aquifers or surface contamination.

Progressive decommissioning (sealing) of extraction wells will occur each extraction year in addition to progressive annual rehabilitation of temporarily disturbed areas. Temporarily disturbed areas include land required to accommodate the

extraction wells, drilling rig access trails, equipment laydown areas within well cluster areas and trails to accommodate the slurry lines and water return lines. Decommissioning activities will occur year-round, weather permitting. Once sealed, topsoil organics will be placed on top to allow for vegetation regrowth and remediation of the surface land.

Disturbed areas will be allowed to revegetate naturally and will be augmented using an approved native seed mixture and native plantings if required. Monitoring programs and follow-up plans will include a Progressive Well Abandonment Plan, Revegetation Monitoring Program, a Heritage Resources Protection Plan and a Closure Plan.

## PERCENTAGE OF LAND RECLAIMED ANNUALLY



Note: Values were obtained from public sustainability filings from a sample of mining companies. Percentages were calculated as the current year reclamations as a percentage of total disturbed lands.







# REDUCING EMISSIONS



As Canada has committed to achieving net-zero emissions by 2050, Sio is dedicated to delivering climate and social consumption solutions.

Sio recognizes our operations generate greenhouse gases and other air emissions, which can affect local air quality and contribute to climate change.

As part of our original submissions for the Vivian Sand Extraction Project, annual emissions of greenhouse gases (GHG) were estimated from onsite activities, including drilling, onsite transportation, extraction, slurry handling, and sealing of the wells. From the original drilling plan of 467 extraction wells per year, it was estimated yearly emissions would be

approximately 6,797 tCO<sub>2</sub>e/year, or approximately 0.0296% of the total reported Manitoba emissions in 2019.

With our updated drilling plan of 324 extraction wells per year, there is a reduction of equipment needed and overall runtime of drilling rigs. While the number of extraction wells required has been reduced by approximately 30%, Sio expects emissions to be reduced by approximately 25% due to some equipment still being necessary. Further detailed work will be performed over the next year to refine this estimate.

## ESTIMATE OF ANNUAL EMISSIONS FROM ONSITE OPERATIONS

EMISSION SOURCES	Emissions from Original Drilling Plan [tCO <sub>2</sub> e/year]	Emissions from Updated Drilling Plan [tCO <sub>2</sub> e/year] <sup>1</sup>
<b>DIRECT EMISSIONS</b>		
EXTRACTION	4,627	
DRILLING	1,206	
SEALING	323	
SUPPORT	93	
SLURRY HANDLING	536	
<b>INDIRECT EMISSIONS</b>		
POWER CONSUMPTION	12	
<b>TOTAL DIRECT AND INDIRECT EMISSIONS</b>	<b>6,797</b>	<b>~5,098</b>

<sup>1</sup> Note: This estimate will be refined with further due diligence.

# ENERGY CONSUMPTION USING RENEWABLE POWER

**7** AFFORDABLE AND  
CLEAN ENERGY

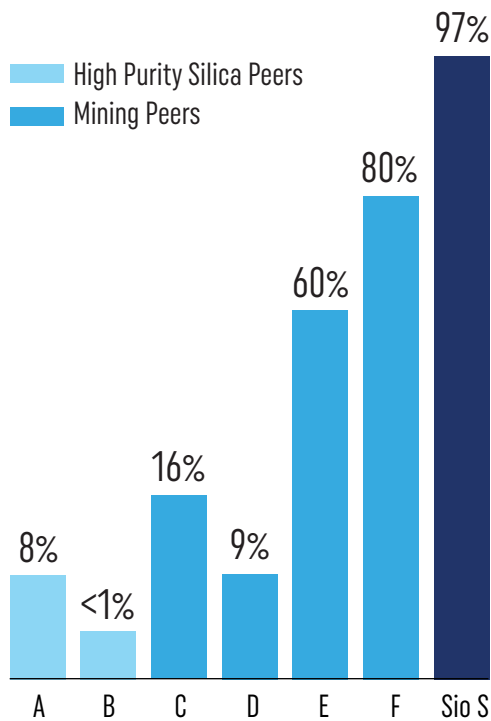


One of the many benefits of operating in Manitoba is access to the Manitoba Hydro power grid.

As with any operation, Sio Silica requires power for our slurry lines and our Processing Facility. Manitoba Hydro is a national leader in lower greenhouse gas emissions, providing renewable energy powered primarily by hydroelectric stations and supplemented by private wind farms.

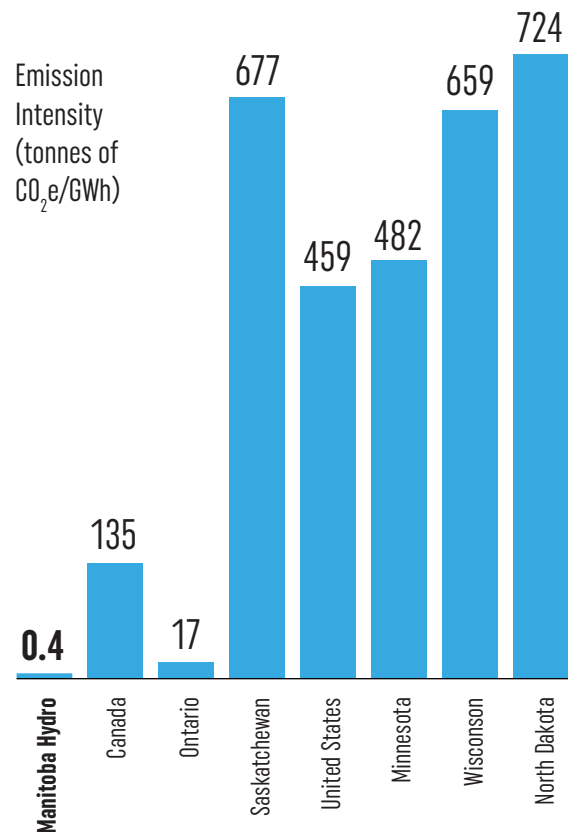
Manitoba's hydro-electric power grid is not only one of the most affordable power sources in the world but aligns with Sio's mission to be one of the most environmentally friendly, responsibly produced and sustainable mining operations in the world.

## PERCENTAGE RENEWABLE POWER COMPARED TO PEERS



Note: Values were obtained from public sustainability filings from a sample of mining companies. Percentages represent the amount of purchased electricity derived from renewable sources as a percentage of total purchased energy.

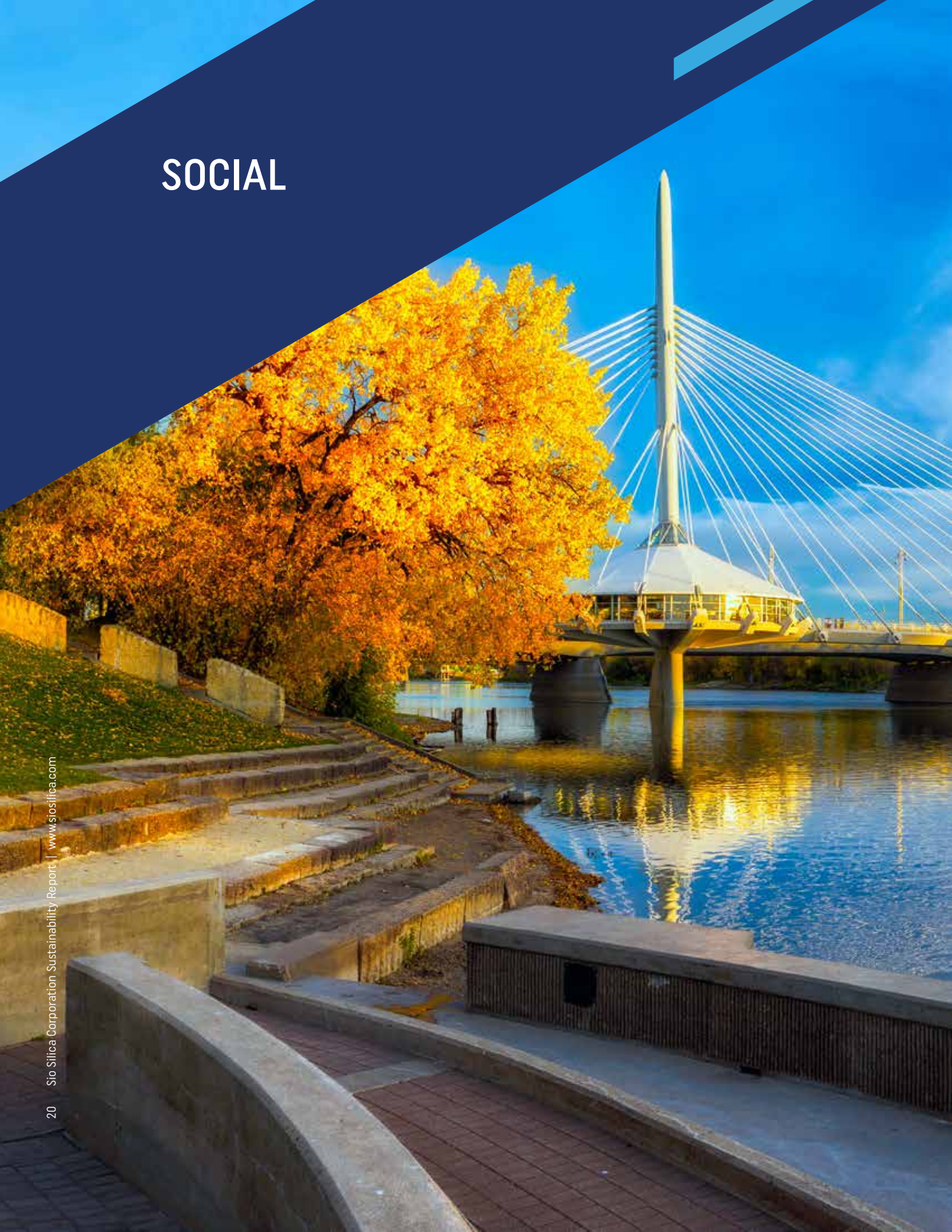
## GHG EMISSIONS INTENSITY COMPARISON OF ELECTRICITY GENERATION



Note: ECCC, 2019b; Manitoba Hydro, 2019; United States Energy Information Administration, 2019



# SOCIAL



# COMMUNITY ENGAGEMENT

Sio recognizes that in order to ensure our developments and operations have the greatest positive impact on the communities where we work, meaningful and transparent community engagement is critical.

In August (with Covid-19 restrictions in place) we hosted an online informative webinar to share the results of a hydrogeology study in the region, provide key background details on silica, and provide an update on our environmental approvals.

In November we were happy to host an in-person drop in event with experts from AECOM to present information and address questions. Displays and information regarding our projects provided details related to silica, the sand extraction process,

groundwater impact mitigation and protection, geotechnical assessments, economic development, community investment, and a further update on our approvals for the Vivian Sand Project.

We will continue to engage with, and inform, communities in the region about our work and demonstrate our commitment to them, the environment, and to economic development in the region.

## SHARING INFORMATION WITH OUR COMMUNITIES

Sio is committed to engaging with our communities in various ways to reach as many audiences as possible to provide education and understanding about our product and our operations.

In 2021 we launched our YouTube series FACTS MATTER to offer another way to share more information and answer questions about our project. The videos to date include the following:

- The Aquifer
- The Extraction Process
- Subsidence
- Community Economic Development
- Residential Water Wells



<https://www.viviansandproject.com/>



# FACTS MATTER

What you need to know about SILICA and the VIVIAN SAND PROJECT

# COMMUNITY INVESTMENT AND DEVELOPMENT

**8** DECENT WORK AND ECONOMIC GROWTH



## 2021 COMMUNITY INVESTMENTS

**\$2,500**  
Friends of  
Sci Sabers  
Football Club

**\$15,000**  
Brandon Commonwealth  
Air Training Plan  
Museum

**\$5,000**  
Springfield  
Young Entrepreneurs  
Challenge

**\$6,500**  
Springfield  
Foodbank

**\$5,005** **Kidney  
Foundation  
of Canada**

Sio is committed to the communities where we work, and to the province of Manitoba. We believe it is crucial that Sio's operations directly contribute to growth and development in local communities and the region.

The Vivian Project will contribute \$1.2B to Manitoba through taxes, payroll, royalties and municipal charges. The facility and extraction activities will directly employ 50-100 people

and additional indirect employment related to transportation, supplies and services. Estimated direct revenue to the Rural Municipality of Springfield is \$2-\$3 million per year and estimated indirect revenue of \$2-\$4 million per year.

In 2021 Sio directly contributed to the communities where we live and work, identified by both community priorities, and Sio team's interests and passions.

Going forward Sio will develop a Community Investment Plan that will align with community priorities and needs where we work, as well as who we are as a company.



# INDIGENOUS ENGAGEMENT AND RELATIONSHIP BUILDING

Sio recognizes that engagement with Indigenous communities needs to start with relationships built on trust, respect and responsiveness.

The focus on Indigenous engagement in 2021 was to further develop relationships with Indigenous communities, as well as staff within the Government of Manitoba, to set a foundation for continued engagement, learning, and sharing of future opportunities throughout the development of the Vivian Sand Project. COVID-19 presented some challenges with in-person meetings, however online meetings were held to share project updates to address emerging concerns and issues.

In 2021 Sio hired an Indigenous engagement consultant to advise and support our efforts, and to lay foundations for strong relationship building, this included our engagement with the Brokenhead Ojibway Nation and the Manitoba Métis Federation. It is our commitment to continue to engage and work with Indigenous communities in the areas where we operate to ensure transparency, mutual respect, and collaboration with the goal to build lasting relationships.



# GOVERNANCE



## GOVERNANCE

# LEADING THROUGH INNOVATION

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



Sio recognizes that to effectively mitigate risks and leverage opportunities associated with ESG material topics, that business as usual is not enough.

Innovation must be core and foundational to our business practice. We will continue to be a leader through innovation, pursuing new technologies and strategies that challenge not just our operations but the mining industry and beyond. In 2021 we were granted an Intellectual Property

ART for innovating technology by Innovation, Science and Economic Development Canada, Canadian Intellectual Property Office for the development of our "Air Lifting Sand" Technology. In 2022, we will file enforceability of the patent in other jurisdictions.

## GOVERNANCE

# NEW PARTNERSHIPS

17 PARTNERSHIPS FOR THE GOALS



Sio values collaboration and partnerships and believes these are critical to long and prosperous growth.

Partnering with community and corporate organizations provides opportunities for us to learn from others and builds a strong foundation of support for our developments and projects.

We are a member of the Springfield Chamber of Commerce, participating in events such as Dinner with Council, the Annual General Meeting, and an Awards banquet night. We are also

members of both the Manitoba Heavy Construction Association and the Manitoba Chamber of Commerce.

Our commitment to Manitoba and building both partnerships and business opportunities is a core priority for our leadership team. We are proud of our work in the province and will continue to build and grow relationships.

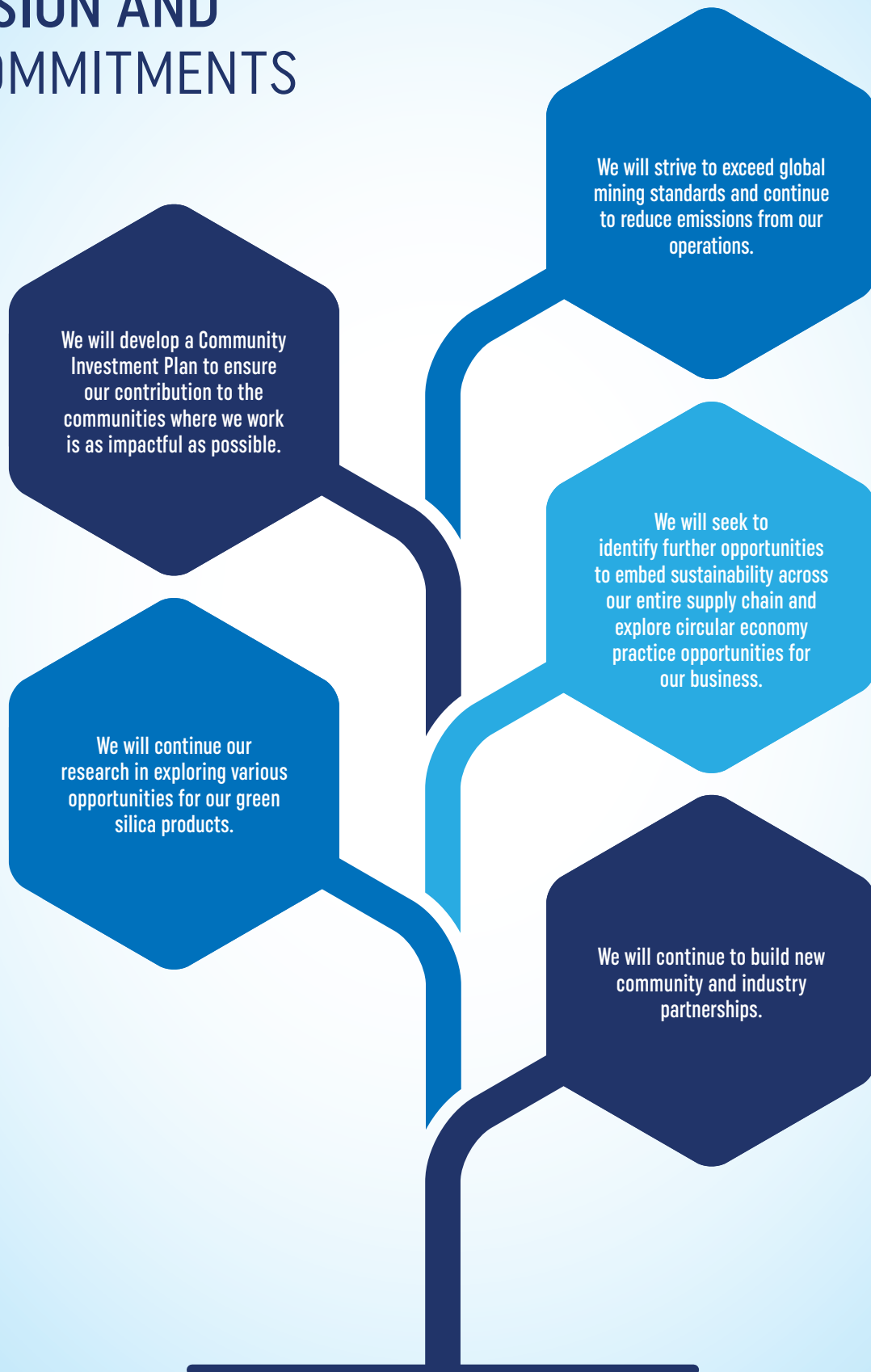
# COMMITMENT TO SAFETY

People are at the core of Sio's business.

We are committed to ensuring all aspects of our operations are conducted at the industry best standards for safety, and that our business practices are fair and ethical. In 2021 we developed our Code of Conduct & Safety Manuals to guide our staff and ensure safe operations before we even break ground on our Vivian Sand Project.



# VISION AND COMMITMENTS



IN MEMORIAM

# REMEMBERING DENNIS NERLAND

In 2021 we were saddened with the passing of Dennis Nerland, Sio Director.

Dennis has been a valued leader, mentor and friend who was instrumental in founding Sio Silica. He played a critical role in supporting management's initial corporate structure development and funding. Dennis will be missed, and our condolences go to his family and to his close friends.







**SIO SILICA CORPORATION**  
**BUILDING INNOVATION FOR GENERATIONS**

Suite 1930, 440 – 2<sup>nd</sup> Avenue SW  
Calgary, Alberta T2P 5E9 CANADA

[www.SIOSILICA.com](http://www.SIOSILICA.com)