



SIO Silica Sand Extraction Project – Protecting our Environment/ Protecting our WATER

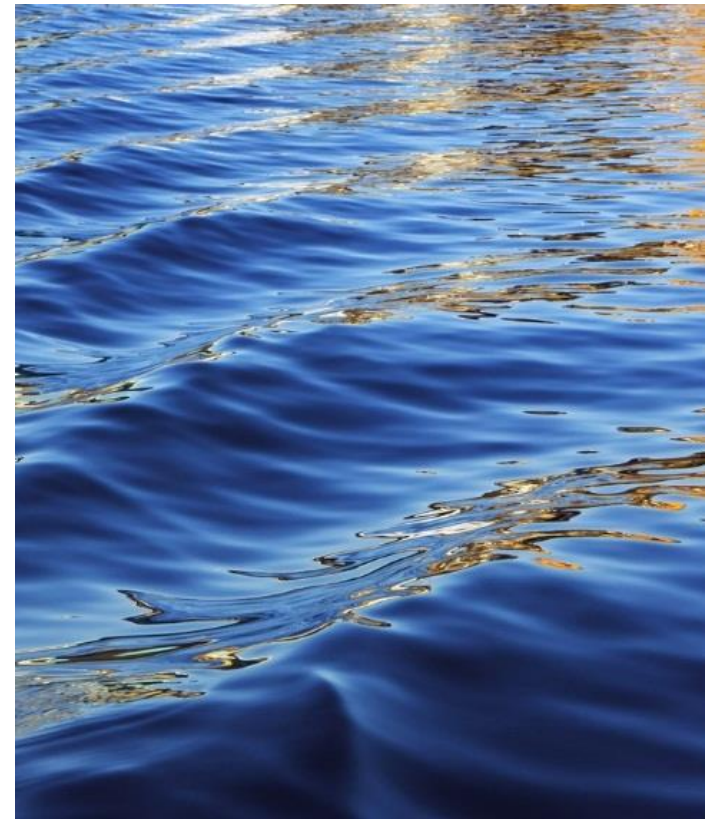
Public Registry 6119.00





Do you want to know why there aren't more people here? SIO "public engagements" could only share an incomplete story, because feedback and reviews were not available at the time they started their "public engagement".

By design or accident, people are lured into a false sense of security by hearing only that initial, incomplete, one-sided, limited story – only the SIO side. Thus, much of the public is unaware of the FULL STORY – the STORY THAT INCLUDES THE RISKS AND CRITICAL ANALYSIS FROM THE MANY EXPERTS LIKE ARCADIS, POROUSTEC, and Dr. Eva Pip, and others, who are looking at critical project deficiencies from an objective, third party position, **without being motivated by PERSONAL FINANCIAL INTERESTS.**

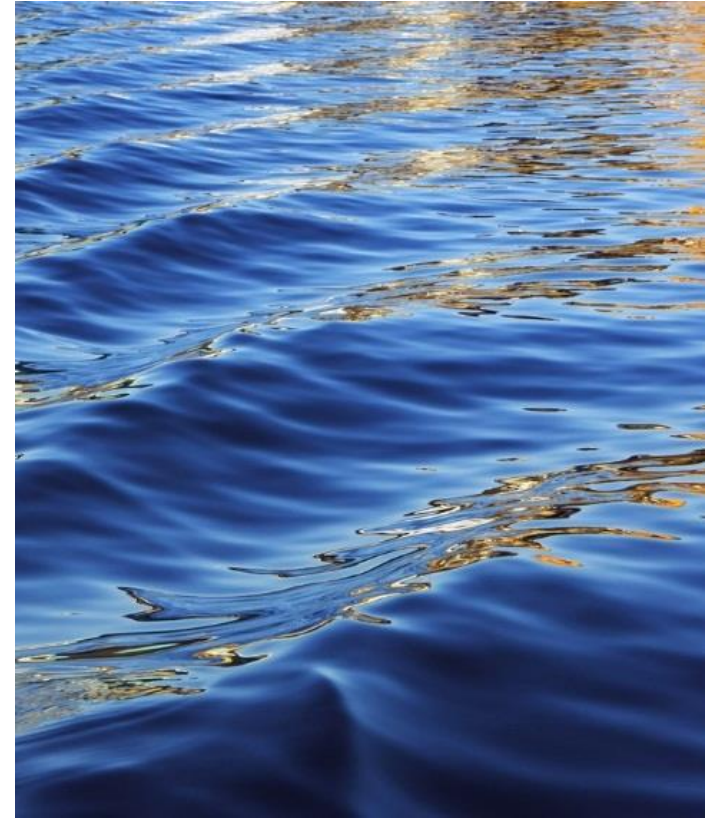




To be FAIR and create an INFORMED PUBLIC, the CEC SHOULD DO THE EQUIVALENT of the SIO “engagements” AGAIN, sharing ALL SIDES of the story, including the analysis and critiques,

and then see what PUBLIC opinion is.

The more I have read and researched and understood the project deficiencies and risks, the more I wanted to cry...





Back to the engagements, these people, the already “informed”, and the uninformed - **EVERYONE** is leading **BUSY LIVES** – and also assume that the government has their back and is **PROTECTING THE ONLY SOURCE OF WATER for Southeastern Manitoba!!!**

This is NOT YET what is happening, but it might be when the CEC RECOMMENDS TO THE MINISTER TO DENY THIS LICENCE.

Although - I do have a new and catchy slogan for SIO Silica
(for free – no compensation required! 😊)

“SIO Silica–WRECKING Manitoba–ONE WELL AT A TIME”



Nov 15, 2021 Terms of reference from the Minister:

Terms of Reference

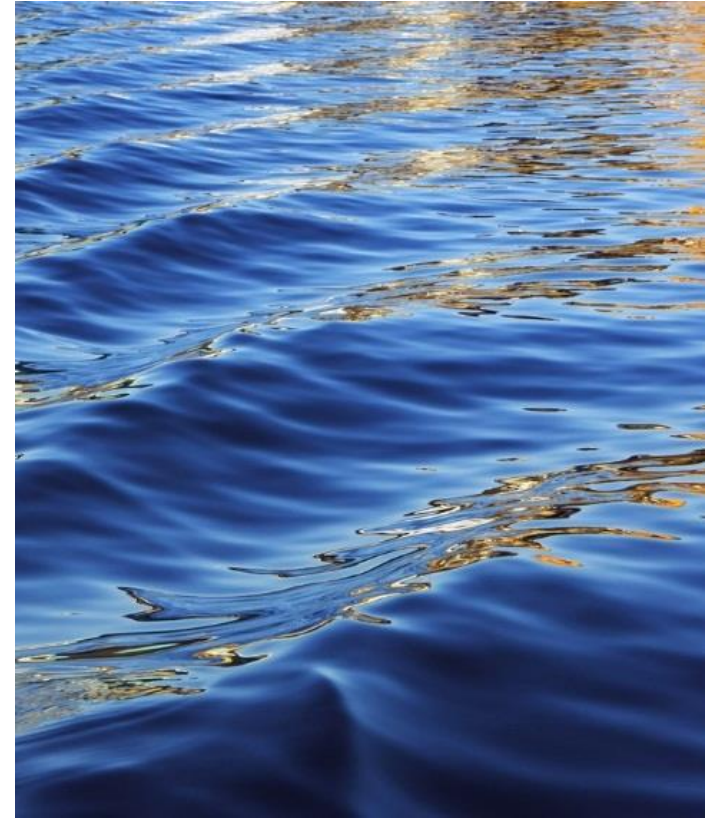
1. The CEC will conduct a technical review of the Environment Act proposal and the hydrogeology and geochemistry assessment report and provide advice and recommendations to the Minister regarding potential environmental and health effects of the proposed sequential installation, operation and decommissioning of silica sand extraction wells for the silica sand extraction project.
2. In providing advice and recommendations, the CEC will provide members of the public the opportunity for input regarding the CanWhite Sands silica sand extraction project proposal at a public hearing in a location consistent with the affected community.



If you are assigned to look at the “environmental effect” – would the impact of destroying a limited and only source of water – versus destroying one of multiple sources of water - be something you need to take into consideration?

Of COURSE! It HAS TO BE!

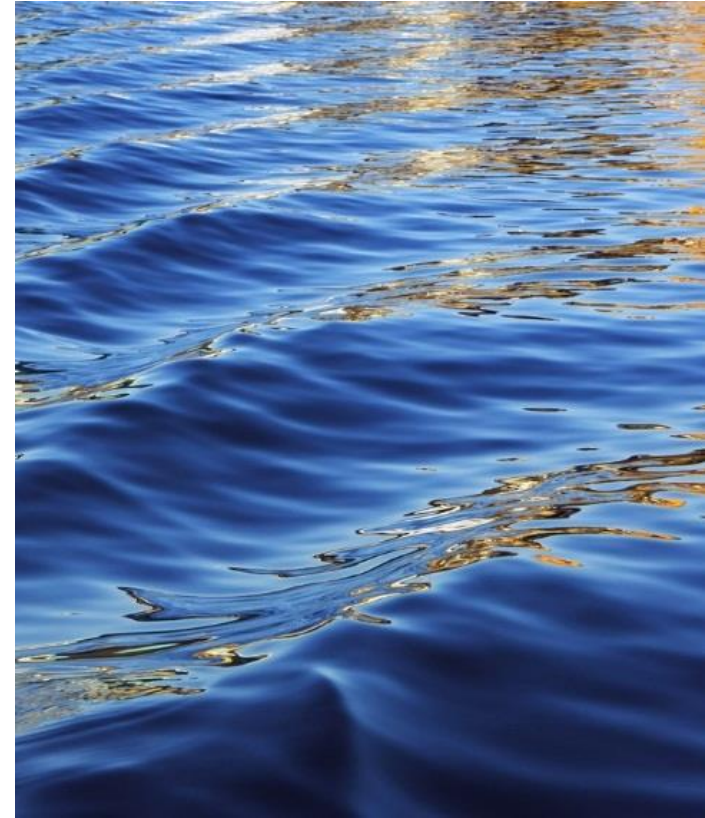
So “Best Practice” would suggest that this issue should be looked at from both a “macro “ or “high level” perspective – and a “micro” – or “detailed” perspective.





AND that this should be a comprehensive search for the TRUTH – based on evidence, and principles, going where the trail leads.

Decisions should be made on facts – so... before we start, some consensus on basic or generally accepted facts... that will provide essential CONTEXT, without which, you cannot make appropriate RECOMMENDATIONS or provide advice.



The INDISPUTABLE Facts:

1. The basics:

- We are on the Planet Earth
- The year is 2023
- **The planet is experiencing a climate crisis, driven by human activities**
- Did you know? ALBERTA is the most polluted and polluting province in Canada

From the [Conference Board of Canada](#), March 8, 2023:

Alberta ranks 25th and scores “D–” grades on most of the environmental performance indicators. Alberta does poorly on all indicators of air pollution, scoring “D–” grades on Nitrogen Oxides (Nox), Volatile Organic Compounds (VOC’s), and Particulate Matter (PM₁₀) emissions and a “C” on Sulfur Oxide (SOx) emissions. Alberta’s performance on the climate change indicators is dismal, with “D–” grades on GHG emissions, low-emitting electricity production, and energy intensity. The province’s second “C” grade is on water withdrawals, where it **ranks second-to-last among the provinces.**

Currently, Manitoba has its own problems, but gets an “A” on water withdrawals.

Do we want Alberta’s poor attention to and respect of the environment to be exported to Manitoba with a project like this?

See also: https://climateactionnetwork.ca/wp-content/uploads/2014/02/AirandTarSandsReport_FINAL.pdf

The **INDISPUTABLE** Facts:

2. **MINING** is known for its negative impact on the environment.
[The Environmental Problems Caused by Mining | Earth.Org](#)
3. Silica sand **MINING**, in particular, is also causing a **GLOBAL** environmental crisis. This new **UNTESTED** process is only going to punish the environment in a new and different way and will leave **MANITOBA** with a **DISASTROUS** mess that we won't be able to fix.

See the **FORBES** video: How Sand Mining is Quietly Creating a Major Global Environmental Crisis – available on YouTube – published Nov 29, 2021

The INDISPUTABLE Facts:

5. Our WATER:

Water Is ESSENTIAL to life

Did you know? Manitoba already has a policy on water called
[Manitoba's Water Management Strategy](#)

So what I am about to share **isn't** community groups being dramatic or hysterical, (and BTW they are not!) - this is the Manitoba government's POLICY:

p. 16 of the Strategy **RECOGNIZES THE VALUE OF WATER** and states:

"Water is life. It is necessary for the survival of all living organisms on Earth; ... Despite how valuable water is to humans, the environment and our economy, **we often take it for granted,**... **Although Manitoba is often thought of as having an abundance of water,** the province is facing water **scarcity in some regions where** water supply no longer meets the demand.

The INDISPUTABLE Facts:

The Province of Manitoba's Water Management Strategy con't

6. The Strategy also identifies three STRATEGIC OBJECTIVES:

- **Protect drinking water sources.**
- **Value groundwater and sustainably manage and protect the resource.**
- Identify, communicate and mitigate groundwater quality and quantity issues

7. "Manitoba's population is expected to increase by approximately 26 per cent (~360,000 residents) from 2020 to the early 2040s. **Manitoba's water supplies are not unlimited,** and both population and water-intensive uses will continue to grow. **Without a concerted effort, there is an increasing risk that available water supplies will not meet this growing demand.** In addition, during times of severe drought, the amount of water available for human use decreases...

The INDISPUTABLE Facts:

2. [Manitoba's Water Management Strategy](#): p. 16 con't

“Climate change is expected to make extreme heat and drought-driven water shortages more frequent and severe. To address these challenges, a shift in our mindset about how we use water is needed. To ensure sufficient water supplies to meet the needs of current and future generations, **water must be treated as the precious and at times scarce resource that it is.** Manitobans and all water users must **respect the value of water**, use only what is needed, and find ways to stretch limited supplies further.

3. The Water Management Strategy also talks about **DROUGHT** (p. 20):

“Climate change will exacerbate the frequency and severity of extreme events, such as floods and droughts, posing real and potentially significant risks to the province. Manitoba is expected to experience warmer overall temperatures, changes in precipitation and more unpredictable weather with a greater frequency of extreme events. Changes in climate are also expected to shift the timing and availability of water, **with an increased risk of water supply shortages in the summer and excess moisture in the spring.”**

WE ARE ALREADY PREPARING FOR LIMITED WATER SUPPLY!!! WITHOUT THIS PROJECT and THE RISK it creates!

The INDISPUTABLE Facts:

3. Did you also know?

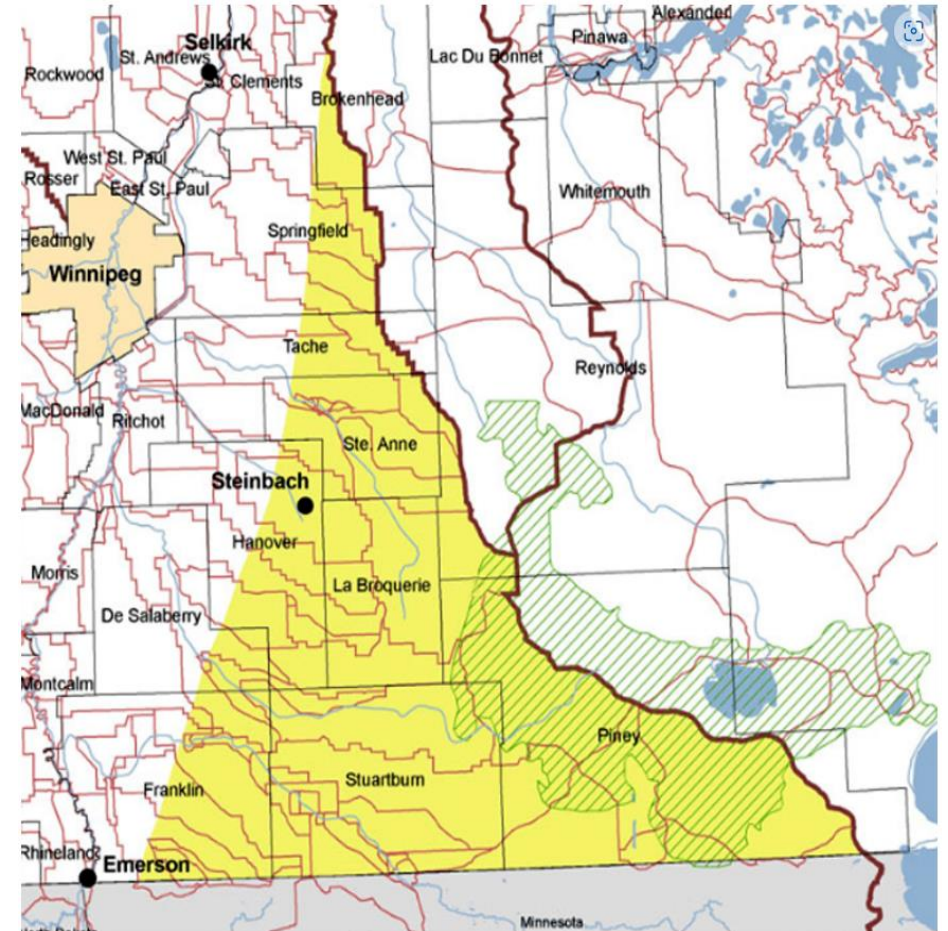
Manitoba already has a policy on **DROUGHT** called
[Drought Management Strategy](#)

“In the 20th century, **billions of dollars of damages have occurred as a result of droughts across the Canadian Prairies....** The economic losses caused by severe drought make DROUGHT one of Canada’s most costly hazards (Institute for Catastrophic Loss Reduction, 2010)..., **the most severe and widespread droughts occur on the prairies.** As reliable and adequate water supplies are required to maintain healthy environments for people and ecosystems, **the presence of ANY kind of drought or water shortage may cause a serious threat in Manitoba.** Water shortages stress water supplies, deplete soil moisture reserves, reduce streamflows, lower lake and reservoir levels and **diminish groundwater supplies.”**

DROUGHT in the prairies, is actually CERTAIN.... Where are the climate experts to discuss drought on the prairies in southeastern Manitoba and the impact of the SIO project on limited water supplies under CERTAIN DROUGHT?

The INDISPUTABLE Facts:

1. The Aquifers supply most of **southeastern Manitoba** with usable, drinkable, relatively safe water.
2. Who is “southeastern Manitoba”?
 - R.M. of Brokenhead
 - Brokenhead₄ IRI
 - R.M. of Hanover
 - R.M. of La Broquerie
 - R.M. of Reynolds
 - R.M. of Ste. Anne
 - R.M. of Tache
 - City of Steinbach
3. **Total Population: 93,950 Private dwellings: 35,708**
4. What do you imagine is the value of the **existing residential assets in all these communities?** , What are rural properties or rural businesses worth without access to a. water or b. usable, safe, high quality water? IF you use an average value of a developed property in rural municipalities - \$300,000.00 to \$500,000.00. @\$500,000.00/property, just the residential value of the properties would be approximately **\$17 BILLION dollars.**



The yellow roughly illustrates the region that makes use of the aquifer (map provided by Manitoba Wildlands)

Map from:

[Municipalities Thirst For Knowledge In Ongoing Aquifer Debate - SteinbachOnline.com - Local news, Weather, Sports, Free Classifieds and Job Listings for Steinbach, Manitoba](https://www.steinbachonline.com/)

The INDISPURABLE Facts: Who is affected?

Municipality	MSSAC member? (Municipal Silica Sand Advisory Committee)	Population	Private Dwellings
R.M. of Brokenhead	Yes	5,414	2,213
Brokenhead 4 IRI		434	178
R.M. of Hanover Hanover Municipality - History (hanovermb.ca)	Yes	17,216	5,305
R.M. of La Broquerie	Yes	6,725	2,177
R.M. of Reynolds	Yes	1,344	910
R.M. of Springfield	No	16,142	5,992
R.M. of Ste. Anne	Yes	5,584	2,092
R.M. of St. Clements	Yes	11,586	5,720
City of Steinbach	Yes	17,589	7,004
R.M. of Tache	Yes	11,916	4,117
TOTAL	8	93,950	35,708

Stage 1 “Macro” analysis:

So, you’re going to allow a “FOR PROFIT” company from an industry already known for its DISASTROUS environmental impacts - use OUR ONLY SOURCE OF LIMITED PRICELESS WATER, NECESSARY for life and required by ALREADY existing residents, businesses and industries to extract something less valuable – sand – for their own profiteering processes?

Does anyone want to trade me:

– your kids for a new vehicle?

-need more good examples of total rip offs!

Stage 1 "MACRO" Analysis for this project and CEC's
RECOMMENDATION TO THE MINISTER SHOULD BE:

DENY REJECT DENY
DENY REJECT DENY
REJECT REJECT DENY
REJECT

WHY DENY?

Because we know:

1. Water is life.
2. Water supplies are limited in this area
3. The aquifers are the **ONLY SOURCE OF WATER** in southeastern Manitoba
4. The timing of this project is **TERRIBLE given** current climate change predictions and **DROUGHT** risk as identified by our **OWN GOVERNMENT** in both the Provincial **WATER MANAGEMENT** and **DROUGHT MANAGEMENT** strategies.**STRATEGY**

THIS IS NOT THE RIGHT TIME to risk this **PRICELESS, LIMITED** resource – our **WATER**.

Is this not just **COMMON SENSE???**

This project adds **UNACCEPTABLE RISK** to a water supply already **CHALLENGED**, and will continue to be even more extremely challenged, by climate change

Don't agree yet? OK! Let's go on!! Now, let's talk about the **PREDICTABLE RISKS**.

But first - **A comment:**

As a layperson, I don't need to be an expert on the detailed operations of this project. There are now **thousands of pages** of information available on this project and the potential risks. How many Ph.d's and highly educated professionals, educated in the various areas of hydrogeology, engineering, chemistry, and other specialities, have provided comment already?

What I need to know as a layperson, is that many EXPERTS have provided opinion and there is **NO CONSENSUS** that this project is great, good for the environment, sustainable, or safe, contrary to EVERYTHING that is on SIO's website and propaganda brochures.

Worse, qualified and educated experts – from SEPARATE SOURCES – and with **NO PERSONAL FINANCIAL INTEREST – UNLIKE SIO and SIO CONSULTANTS** - have corroborated, verified and supported each other's opinions – there is **RISK** and many problems have been identified with the assumptions, modeling and design of this project **by the EXPERTS**.

The RISKS:

So – if many experts have identified and agree about the risks – except SIO -
what does this mean?

YOU KNOW THE RISK IS DEFINITELY NOT 0%!

The risk of a bad event – could even be 100%!!!

Where is the risk on the continuum?
Is it even capable of being established?



So, What risk is acceptable to your **ONLY** source of **PRICELESS**
WATER?

Stage 2 “Macro” analysis: Expert Opinions and Level of RISK to ONLY SOURCE OF WATER
CEC’s RECOMMENDATION TO THE MINISTER SHOULD BE:

DENY REJECT DENY
DENY DENY
REJECT REJECT DENY
REJECT

The INDISPUTABLE Facts: “RISKS” Identified by Third Party Experts

Summary: Issue/Criticism/Deficiency – Arcadis, PorousTec, Dr. Pip, Matrix Solutions, M. LeNeveu

1. Whole scope of the project not being assessed for full environmental impact (Project splitting: an intentional means of preventing the full assessment)
2. Not following legislation and/or protecting the integrity of the aquifers (Groundwater and Wells Act Regulation-(3)(1))
3. IRREVERSIBLE IMPACT
4. Water quantity
5. Water Quality – increase in surface contaminants
6. Water Quality – change in composition of water
7. Acrylamide
8. Subsidence - surface
9. Subsidence – subsurface
10. Impact on neighboring properties /individuals/creatures – respirable silica dust causing silicosis
11. Damage to Ecosystem, habitats, deforestation, light and noise pollution

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1. **Whole scope of the project not being assessed for full environmental impact (Project splitting: a means of preventing a full assessment of the impact over the lifetime of project.)**

Can I just tell you that one engineering company doesn't take it lightly when it says there are “MATERIAL DEFICIENCIES” in another engineering company's proposal. THIS IS A BIG DEAL.

“Based on our review, Arcadis reached a series of conclusions which, in broad terms, relate to technical issues or the EA process. The most notable technical conclusion deals with the potential geotechnical failure of the Winnipeg Shale, which separates the Red River Carbonate Aquifer from the Winnipeg Sandstone Aquifer. The Project Proposal presents no information related to the potential failure of the Winnipeg Shale. With regard to the EA process, Arcadis concluded that the abbreviated temporal scope, substantively smaller spatial scope and exclusion of critical project components constitutes “project splitting”. Arcadis considers this to be a material deficiency with the Project Proposal.”

The INDISPUTABLE Facts: “RISKS” Identified by Third Party Experts

Summary: Issue/Criticism/Deficiency – Arcadis, PorousTec, Dr. Pip, Matrix Solutions,

2. Not following legislation and/or protecting the integrity of the aquifers (Groundwater and Wells Act Regulation-(3)(1)

“Furthermore, the aquifers of the project area are specifically protected by provincial legislation, and interconnection and mixing involving the Winnipeg Formation is prohibited” - Quoted from Dr. Eva Pip’s report – p. 35 – available here: [ws21dr.evapip.pdf \(cecmanitoba.ca\)](http://ws21dr.evapip.pdf(cecmanitoba.ca)):

The Groundwater and Water Well Act (C.C.S.M. c.Gg110) [Well Standards Regulation, M.R. 215/2015 \(gov.mb.ca\)](http://WellStandardsRegulation,M.R.215/2015(gov.mb.ca)):

Interconnection of geologic formations:

3(1) Without limiting the generality of clause 2(e),

a person must not construct or seal a well or test hole in a manner that allows the interconnection or mixing of groundwater between the Winnipeg Formation and any overlying aquifer

Definition 3(2)

In this section, "Winnipeg Formation" means the shale, sandstone and sands of the Ordovician Winnipeg Formation

The CEC’s third party reviewer – ARCADIS – also states from their presentation:

“It is Arcadis’ understanding that separation of the Red River Carbonate and Winnipeg Sandstone aquifers is **necessary to protect the groundwater resource of the region.**”

The INDISPUTABLE Facts: “RISKS” Identified by Third Party Experts

Summary: Issue/Criticism/Deficiency – Arcadis, PorousTec, Dr. Pip, Matrix Solutions,

2. Not following legislation and/or protecting the integrity of the aquifers (Groundwater and Wells Act Regulation-(3)(1))

SIO’s own experts talk about this as if it’s no big deal??? Stating that **if there is intermixing of the waters from the two aquifers, then...**

From SIO’s EAP – [Hydrogeological Assessment Final Report: AECOM](#) - Exec summary by AECOM

“Interconnection between the two aquifers is a common occurrence because many drinking water wells have been screened across the Red River Carbonate and the Winnipeg Sandstone. **Should project operations result in a more interconnected aquifer system comprising the Red River Carbonate aquifer and the underlying Winnipeg Sandstone aquifer,** groundwater quality would tend to reflect conservative mixing of the two water types (i.e. limited geochemical reactions) resulting in water quality that is similar or slightly better. Although the naturally elevated concentrations of dissolved iron and manganese were simulated to decrease in response to aeration or mixing, **they may remain elevated above drinking water quality criteria during and following operations...**

What do you mean “if there is mixing of the two water types” There should be NO MIXING!!!

Why would SIO get a pass on legislation that already applies to everyone else in Manitoba?

The INDISPUTABLE Facts: “RISKS” Identified by Third Party Experts

Summary: Issue/Criticism/Deficiency – Arcadis, PorousTec, Dr. Pip, Matrix Solutions,

3. IRREVERSIBLE IMPACT

Do we even need to talk about this?

If the shale collapses and allows intermixing, **OBVIOUSLY**, there is no way to put the **WATER GENIE** back in the bottle!

THEN WHAT HAPPENS?

The INDISPUTABLE Facts: “RISKS” Identified by Third Party Experts

Summary: Issue/Criticism/Deficiency – Arcadis, PorousTec, Dr. Pip, Matrix Solutions,

4. Water quantity

Water quantity being used – how much water will SIO be using? Can it be supported?

Result: 2998 cubic meter = 791,987.81297 gallon (US)/day????(550 U.S gallons PER MINUTE???) ReInjection is a reInjection rate of approximately 1,445 m³/day (265 US gpm) as summarized for each well cluster in Appendix H. This is the same amount of water that 100 horses drink in a day, withdrawn in ONE MINUTE!

[ir_rm_of_springfield.pdf\(cecmanitoba.ca\)](#) p. 9 Information Request

Of this water, how much will BE WASTED??

So if they come in and start this using this EXPONENTIAL amount of water, what happens to everyone else?

The INDISPUTABLE Facts: “RISKS” Identified by Third Party Experts

Summary: Issue/Criticism/Deficiency – Arcadis, PorousTec, Dr. Pip, Matrix Solutions,

5. Water Quality – increase in surface contaminants

from Eva Pip’s report: “The large number of wells – The proposed project initially planned to drill up to 467 (subsequently amended to 324) production wells per year, penetrating the aquitard and intruding on both aquifers. Current estimates amount to >7700 wells over a 24 year period. An unknown number of additional wells will be used for monitoring and testing or will be unusable. The present application refers only to the first 4 (possibly 5) years.”

~7,700+?

Increases the risk of surface contaminants being introduced into the aquifers, because paths are being created by the wells. How is this even being proposed - for this to happen – TO OUR ONLY SOURCE OF WATER!!!

Think of Walkerton, Ontario in 2000 – 7 people died, 2300 were made ill because of surface contamination that was introduced into the wells. And note, this was a public water supply being continuously tested. Although this event was TERRIBLE and partially a result of the failures of the stewards, please tell me, when it’s **private wells and residents dispersed over a potentially wide area**, how long might it take for health departments/government to identify the problem and isolate the cause? **ESPECIALLY** when I would bet you that most people don’t test as often as they probably should.

The INDISPUTABLE Facts: “RISKS” Identified by Third Party Experts

Summary: Issue/Criticism/Deficiency – Arcadis, PorousTec, Dr. Pip, Matrix Solutions,

6. Water Quality – change in composition of water

The experts debate this – the water being REINJECTED back into the well may contain oxygen, which may potentially cause oxidization of heavy metals – causing them to be released into the water in the aquifers. There are also other reasons why water composition may change.

Although there is **DEBATE** – do you want more heavy metals – like **ARSENIC for example** – in your **ONLY SOURCE OF WATER?**

I will assume everyone has heard of **ARSENIC** – it’s a **POISON** - [Arsenic Poisoning: Symptoms, Causes, and Treatment \(healthline.com\)](#).

Heavy Metals Toxicity and the Environment from [Heavy Metals Toxicity and the Environment - PMC \(nih.gov\)](#) [Paul B Tchounwou](#),* [Clement G Yedjou](#), [Anita K Patlolla](#), and [Dwayne J Sutton](#)

Heavy metals are naturally occurring elements that have a high atomic weight and a density at least 5 times greater than that of water. Their multiple industrial, domestic, agricultural, medical and technological applications have led to their wide distribution in the environment; raising concerns over their potential effects on human health and the environment... Because of their high degree of toxicity, arsenic, cadmium, chromium, lead, and mercury rank among the priority metals that are of public health significance. These metallic elements are considered systemic toxicants that are known to induce multiple organ damage, even at lower levels of exposure. They are also classified as human carcinogens (known or probable) according to the U.S. Environmental Protection Agency, and the International Agency for Research on Cancer.

The INDISPUTABLE Facts: “RISKS” Identified by Third Party Experts

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6. Water Quality – change in composition of water

Where are the HEALTH EXPERTS TO REVIEW THIS RISK? The CEC is supposed to be examining the issues and providing advice and recommendations on the health risks....

PROCESS PROBLEM:

PUBLIC HEALTH – WHO as part of the TAC (Technical Advisory Committee) - would not have considered this risk – as it was not identified IN THE SIO MATERIAL when the EAP was sent for review AND I BELIEVE THEY HAVEN'T RECEIVED THE MATERIAL IDENTIFYING CONCERNS FROM THE REVIEWING EXPERTS?

“Kudo’s” to them however, as they did raise questions about DROUGHT and SUBSIDENCE – not their area of expertise.

The INDISPUTABLE Facts: “RISKS” Identified by Third Party Experts

Summary: Issue/Criticism/Deficiency – Arcadis, PorousTec, Dr. Pip, Matrix Solutions,

6. Water Quality – change in composition of water – UV Treatment?

Once the water and sand “slurry” is removed from the aquifer, there is a proposal to try to “decontaminate” the water being reinjected using a UV treatment before it goes back into the aquifer. There are many reasons identified as to why this might be ineffective, including the level of particles that will be floating in the “slurry” (water and sand filled material removed from the well).

UV treatment of water to be returned to the aquifers from the slurry lines is not effective as this water is turbid, murky water and permeated with particles – this does not allow the UV light to penetrate the water effectively. This process is experimental.

Good idea... experiment with my ONLY source of water....????

The INDISPUTABLE Facts: “RISKS” Identified by Third Party Experts

Summary: Issue/Criticism/Deficiency – Arcadis, PorousTec, Dr. Pip, Matrix Solutions,

7. Acrylamide

Identified by both Dr. Pip and M. LeNeveu

Dr. Pip commentary, p. 230 of her report:

“The fluid in the lines may potentially contain residues of **polyacrylamide** (PAM) from the processing plant. The companion Environment Act proposal for the processing plant (EAPPF) indicates that the clarifier at the facility will utilize polyacrylamide ...for water associated with the dewatering process. The EAPPF (p.3) refers to “using food grade biodegradable flocculant (anionic polyacrylamide)”. **We also see this cruelly duplicitious phrase repeated in EAPPF, Appendix I, question 29; as well as in RPCR (#248), and also in promotional material meted out to the public (SIO, p. 23).** There is no hint from this ‘reassuring’ pronouncement that polyacrylamide biodegrades into highly toxic acrylamide, which is where the problem lies.

- PAM and its breakdown product, acrylamide, are NOT ever added intentionally to any food because of the risk to health from the breakdown product (Health Canada, 2019). Acrylamide is an **objectionable toxic contaminant** in some starchy foods, resulting from processing or cooking at temperatures in excess of 120^o C. (e.g. Tepe and Cebi, 2019). The topic has been reviewed in “Acrylamide – a potent carcinogen in food” by Thomas and Thomas (2012). Acrylamide may also occur as a contaminant in some food packaging. Health Canada (2019) is engaged in monitoring programs and reduction strategies to lessen unwanted incidental acrylamide levels in Canadian food that can harm the health of Canadians.

The INDISPUTABLE Facts: “RISKS” Identified by Third Party Experts

Summary: Issue/Criticism/Deficiency – Arcadis, PorousTec, Dr. Pip, Matrix Solutions,

7. Acrylamide

Identified by both Dr. Eva Pip and D.M. LeNeveu, B.Sc. (hons. physics), B.Ed., M.Sc. (biophysics), former member of the Canadian Society of Safety Engineering

Dr. Pip commentary, p. 230 of her report:

“While PAM has been used as a flocculant in some domestic water treatment plants in some countries, the presence of resulting acrylamide residues and concerns regarding its health effects **have prompted the World Health Organization (WHO, 2011) to caution this use.** “Residual of PAM during the treatment and flocculation process can contaminate the drinking water by the release of the residue.” (Tepe and Cebi, 2019). According to WHO (2011), “Conventional treatment processes do not remove acrylamide.”

Where is Public Health’s review on acrylamide?

The INDISPUTABLE Facts: “RISKS” Identified by Third Party Experts

Summary: Issue/Criticism/Deficiency – Arcadis, PorousTec, Dr. Pip, Matrix Solutions,

8. Subsidence – surface

In the last information I have seen, ARCADIS said that they see the issue of **surface subsidence**, i.e. land collapsing into caverns underneath, as substantially resolved **IF SIO DOES WHAT THEY ARE SUPPOSED TO!**

AND BY THE WAY – WHO IS GOING TO MONITOR THIS?

However, what happens over the 24 years of the project? Will time and other risks, LIKE DROUGHT, cause unexpected consequences? **THEN WHAT?**

The INDISPUTABLE Facts: “RISKS” Identified by Third Party Experts

Summary: Issue/Criticism/Deficiency – Arcadis, PorousTec, Dr. Pip, Matrix Solutions,

9. Subsidence – subsurface

This will be what happens when the **UNKNOWN LONG -TERM IMPACT OF THE MATERIAL BEING REMOVED FROM UNDERGROUND** is experienced – collapse of the shale layers – unexpected movement and water flow events occur.

Sure there are MODELS – all THEORETICAL AND CONCEPTUAL BY THE WAY. AND NOTE THAT THE THIRD PARTY EXPERTS HAVE RAISED MANY, MANY QUESTIONS and CRITICISMS ABOUT THE **ACCURACY** of the SIO MODELING SCENARIOS.

This issue... not that simple... and again.... **IS THIS AN acceptable RISK IF IT IS AFFECTING YOUR ONLY SOURCE OF PRICELESS WATER?**

The INDISPUTABLE Facts: “RISKS” Identified by Third Party Experts

Summary: Issue/Criticism/Deficiency – Arcadis, PorousTec, Dr. Pip, Matrix Solutions,

10. Impact on neighboring properties /individuals/creatures – respirable silica dust causing silicosis

Silicosis can claim someone’s life quickly, and it takes a very SMALL amount of respirable silica to cause this. There have already been COMPLAINTS – as I understand it – about piles of sand left exposed?

So you see... things are already going in an UNEXPECTED and WRONG direction.

The INDISPUTABLE Facts: “RISKS” Identified by Third Party Experts

Summary: Issue/Criticism/Deficiency – Arcadis, PorousTec, Dr. Pip, Matrix Solutions, M. LeNeveu

11. Damage to Ecosystem, habitats, deforestation, light and noise pollution

Not to take too much time on this... its pretty clear what this means!

The RISKS (5):

[SIO's experts!](https://www.gov.mb.ca/sd/eal/registries/6119/appendix_a_part1.pdf) From AECOM Vivian Sand Extraction Project – Hydrogeology and Geochemistry Assessment Report prepared for CanWhite Sands available here:
https://www.gov.mb.ca/sd/eal/registries/6119/appendix_a_part1.pdf

“Interaquifer exchange has reportedly influenced water quality in the Red River Carbonate aquifer in areas with underlying saline water as a result of upward flow of saline water from the Winnipeg Formation Sandstone through **improperly sealed boreholes**. Water quality within the Project Area is generally fresh in both the Red River Carbonate and Winnipeg Sandstone aquifers.” p. 14

I.e. water became salty

p.5...“Consistent with the results of field testing, water levels were simulated to recover relatively rapidly, with approximately 80% recovery approximately two days following the end of production at each well cluster. Groundwater levels are anticipated to return to static water level conditions approximately 20-80 days after production ceases at each well cluster”

In what conditions? What about the conditions after ten years of drought, like the dirty 30's? Which is said to be more of a normal weather pattern for the prairies. “80 days” is almost three months... **so if the water was accessed in May, the groundwater might not be back to normal until – the end of August, during summer? When water is a high priority in the heat of summer? (seriously? This is acceptable?)**

Stage 3: "Micro" analysis: Expert Opinions and Level of RISK
CEC's RECOMMENDATION TO THE MINISTER SHOULD BE:

DENY

REJECT

DENY

DENY

REJECT

DENY

REJECT

REJECT

WHY DENY?

Because we know:

1. Enough unconnected impartial experts have IDENTIFIED THE SAME RISKS about the projects.
2. The risks include serious health risks because of damage to the **ONLY WATER SUPPLY for southeastern Manitoba!** (change in water quality)
3. **And environmental risk, i.e. DAMAGE TO THE ONLY SUPPLY OF WATER, change in what's available (quantity) AND quality**

Where are the health experts to discuss all of these water “quality” THREATS to health? Inevitably, health THREATS are going to turn into MEDICAL COSTS for the PROVINCE, who is ultimately – the taxpayers.

This project adds UNACCEPTABLE HEALTH RISKS to a water supply already CHALLENGED, and will continue to be even more extremely challenged, by climate change.

Don't agree yet? OK! Let's go on!! Now, let's talk about the **DAMAGE.**

Now, let's look at the **DAMAGE**:

If you break it, CAN YOU FIX IT?

NO !

IT'S IRREVERSIBLE!

IRREVOCABLE!

IT CAN'T BE UNDONE!

**GO ASK AN INSURANCE COMPANY FOR LIABILITY
INSURANCE ON THIS PROJECT! I am curious to see what your
premiums will be.**

But WAIT!!!! ISN'T THIS IMPACT IRREVERSIBLE?

Irreversible damage to the Aquifer and natural processes that supply our ONLY SOURCE OF SAFE, USEABLE WATER???

Oh, forget it! What was I thinking?

CEC's RECOMMENDATION TO THE MINISTER SHOULD BE:

DENY DENY DENY
REJECT REJECT REJECT
REJECT DENY DENY
REJECT DENY DENY

IF that is not enough, let's go on to questions of LIABILITY and RESPONSIBILITY:

1. Consequences, Liability and Responsibility:

When there are consequences, how is responsibility and LIABILITY going to be established? Do you think there will be an easy way to establish responsibility? Or is this going to be a re-enactment of the 1970's, when the tobacco companies denied to their LAST BREATH – that smoking causes cancer?

from Dr. Eva Pip's report – p. 84

“Long-term accountability is absent. In the future, a company may no longer exist, it may declare bankruptcy, or reorganize under another name and structure. There are many such mining legacies in Manitoba, where the taxpayer is left to deal with the problem, which is at that stage irreversible. Consider the extreme case of thousands (170,000 (AER, 2021)) of abandoned and orphaned oil wells in Alberta, and stranded landowners, many of whom have waited decades for restoration of their land, that has, and never will, come in their lifetimes, if at all “

2. Let's learn from other Province's mistakes: For example – ALBERTA –the “HOME” Province of SIO Silica

They now get money up front, b/c of too many experiences where the taxpayer is left holding the bag!

– the MOST POLLUTED/POLLUTING PROVINCE IN CANADA – and not feeling guilty about it apparently

From Environmental Science and Technology: [Land and Water Impacts of Oil Sands Production in Alberta | Environmental Science & Technology \(acs.org\)](#)

“One ambiguity that remains is whether resources will be available at the end of a project to ensure that reclamation occurs. In recent years, this problem has been addressed by new rules that mandate oil sands surface mining companies to provide financial security for reclamation in the form of a bond posted to the Environmental Protection Security Fund. (7) By 2010, the total oil sands security fund was 946 million dollars (CAD). (46) The costs of reclamation may not be adequately represented in these funds,have been chronically underestimated. (7)

The current system is in need of a systematic risk management approach to avoid financial liability to the public.

THEY HAVE BEEN AT THIS A NUMBER OF YEARS, are getting funds UP FRONT now, and STILL don't have enough to fix their problems!!!

IF that is not enough, let's go on to questions of **LIABILITY** and **RESPONSIBILITY**:

3. Manitoba has its own bad experience of picking up the bill when profiteering companies decide they don't want to clean up their mess. For example:

Quarry Rehabilitation on Private and Municipal Land Program

[Resource Development | Natural Resources and Northern Development | Province of Manitoba \(gov.mb.ca\)](https://www.gov.mb.ca/resource-development/natural-resources-and-northern-development/)

The Manitoba government has implemented a Quarry Rehabilitation on Private and Municipal Land Program to rehabilitate depleted quarries and pits on private and municipal land. Funding will be available through the program for landowners needing to do rehabilitation work on these lands, with each successful applicant eligible for up to \$200,000 in assistance.

Once again, the government, meaning you and me - the taxpayer - is left to clean up an impossible mess when unethical, irresponsible, profiteering companies abandon their responsibilities. And if SIO leaves a mess, be sure, it will be a BIG MESS if the ONLY water supply is PERMANENTLY DAMAGED.

4. **AND, ONCE THEY ARE IN,** how do you get them **OUT** or to **STOP!??**
if there is an issue, do you think there will be an easy way for the Province to shut down their operations, when they tell you they have contracts and obligations, and now YOU, meaning "WE" the PROVINCE, meaning the TAXPAYERS, has liability for THEIR POTENTIAL LOSSES?

Stage 4 ANALYSIS: Include LIABILITY & DETERMINING RESPONSIBILITY:

SIO SILICA Vivian Project:

REJECT **REJECT**
DENY **REJECT**
DENY **REJECT**
DENY




SIO Silica Vivian Project

This is a bad project, with a

SERIOUSLY BAD potential outcome

IT'S a BAD IDEA!!!

How is it acceptable to give an industrial “for profit” company UNRESTRICTED ACCESS to our ONLY PRICELESS WATER supply in these current conditions?



From a letter, a written submission to the CEC, already posted (WS-26).

This man is a poet.

Quote Jacques-Yves Cousteau : For most of history, man has had to fight nature to survive: In this century he is beginning to realize that, in order to survive, he must protect it!" -.

I often wonder if we are electing the best of people to look after our water sources and environment?

The Crisis of clinging to the lie. We can no longer afford to take nature for granted. We can no longer continue to exploit our finite resources as we see fit; to fulfil the gluttonous greed of economic development, and dump our waste into the environment. The consequences are far too grim.

In so many situations we are so ignorant of the biological and physical world, yet we cling to the belief that we know what we're doing. The truth is,...we have no idea. Everybody chases short-term wealth, even at the cost of destroying their long-term future. We must begin to live, grow and prosper as a partner with nature. We have to keep reminding ourselves that the Sacred Balance with Mother Earth is vital to our very existence. And we must continue to do our part to secure the lives of promise for those yet unborn. I am grateful and acknowledge the words of encouragement, the criticism and the confrontations that are directed to my views, for they provide and nourish my incentives to work even harder to the challenges of changing "what is not right"; knowing fully, there are none so blind as those who do not wish to see.

I recognize that laws and regulations without enforcement and vigilance by authority are useless! I also recognize the continuing need for more and even more regulations tend to rise proportionately as our moral and code of ethics decline. For, to have integrity, "nothing else matters". To not have integrity, "nothing else matters".