File Number:6219.00 - RM of Springfield - Water Treatment Plant Upgrades
Public Consultation Report

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DUGALD OAKBANK WATER SYSTEM (DOWS)

WATER TREATMENT PLANT AND SUPPLY EXPANSION PROJECT

3RD OPEN HOUSE / PUBLIC CONSULTATION

SEPTEMBER 11TH, 2024

Public Consultation Report

EXECUTIVE SUMMARY

This report is prepared as part of the submission for the RM of Springfield Environment Act Proposal File No. 6219.00 *Dugald Oakbank Regional Water Treatment Plant Upgrades* posted to the Provincial Registry May 14, 2024.

As a result of a significant number of public comments with concerns as related to the application, the Director of Environmental Approvals requested via letter date August 16th, 2024, that the RM of Springfield carry out additional public consultation by September 30th, 2024.

Contained herein is a summary of the Public Consultation held on September 11th, 2024.

Public Consultation Notice

The Public Consultation Notice was prepared by the RM of Springfield Water and Waste Department and appeared in the August 29th, 2024, edition of The Clipper Weekly newspaper, posted on the RM website on August 27th, 2024, and via emailing list on September 3rd, 2024.

Date

September 11th, 2024, from 6:00 pm to 8:00 pm

Location

Cooks Creek Community Centre; 32006 Zora Road (68N), RM of Springfield

Moderator

The RM of Springfield engaged the services of Kevin Freedman of the Governance Guru to act as moderator for the event.

Presentation Media

Technical presentations were made in public (on display) and via Zoom Communication. The event was recorded (a copy of the recording is contained herein) as **Appendix A**.

Project Presenters and Technical Staff

The following Technical Staff and experts were on hand to present to the public and address all public questions:

Manitoba Water Services Board:

Nathan Wittmeier, P.Eng., M.T.S. / Chief Engineer

Associated Engineering (Sask) Ltd:

Desiree Pastorin, C.E.T. / Project Manager

Jeff O'Driscoll, P.Eng., IRP / Division Manager, Infrastructure

Robyn Grahame, E.I.T. / Junior Project Engineer

Dörte Köster, Ph.D., P.Biol., R.P.Bio. / Technical Specialist, Limnology

Friesen Drillers Ltd.:

Justin Neufeld, B.Sc.(G.Sc.), P.Geo. / Groundwater Geologist

Jeff Bell, B.Sc. (G.E.), P.Eng. / Hydrogeological Engineer

RM of Springfield:

Phillip Pawluk, B.Sc.(CE), C.E.T., P.Eng., G.S.C, PMP® / Manager of Water and Waste

Colleen Draper, CMMA / Chief Administrative Officer

Attendance

Twenty-Three (23) people registered in person for the event, with an additional twenty-two (22) individuals (inclusive of seven (7) RM staff members) attending via Zoom.

Thirty-eight (38) individuals attended the event. Sign in sheets are attached in **Appendix B**.

Summary of Presentation

The event began with Kevin Freedman introducing himself as moderator and providing the rules and format of the event before introducing the technical staff.

Associated Engineering (Sask) Ltd.'s Desiree Pastorin presented on behalf of the DOWS Water Treatment System and more specifically to the existing Dugald Raw Water Well Field water quality and its comparison to meeting the Canadian Drinking Water Quality Guidelines (CDWQG), followed by the treatment selection process of 80% Greensand Filtration Treatment (GSF) and 20% Reverse Osmosis (RO) polishing water. A sampling of twenty-two (22) water treatment plants in Manitoba using Reverse Osmosis treatment were identified as context to the DOWS Project. Associated Engineering's presentation concluded with discussion regarding the process waste / concentrate water expected volumes, the methods for temporary containment over the spring fall and winter months using an onsite settling pond, and the ability of the Cooks Creek Diversion, the Red River Floodway and the Red River to accommodate the flow volumes and mineral concentrations to meet dilution requirements of the Provincial Tier II Water Quality Objectives in receiving water. A copy of the presentation is attached in **Appendix C**.

Friesen Driller's Ltd.'s Justin Neufeld presented on behalf of the Hydrogeology Investigation Results as related to the Dugald Raw Water Well Field. Friesen Drillers Ltd. presented a brief history of the company and its expertise, information related to the

Manitoba Regulatory Framework including the Water Rights Act (1988), the Environment Act (1987) and the Drinking Water Safety Act (2002). The presentation went on to discuss Confined vs. Unconfined Aquifer conditions and GUDI (Groundwater Under Direct Influence) conditions, a timeline of the Dugald Oakbank Water Supply Project dating back to 2016, the current Dugald Raw Water Well Field and the benefits of the Sandstone Aquifer as a water supply for the RM of Springfield, and discussion on the Saline-Freshwater boundary within the Sandstone Aquifer.

The presentation went on to discuss in detail the Test Well Construction on Mission Road, the 72-hour Pumping Test and Groundwater Monitoring Program, a series of Hydrographs and Background Aquifer Fluctuations. The presentation wrapped up by providing conclusions and recommendations as related to expanding the Dugald Raw Water Well Field in its current location. A copy of the presentation is attached in **Appendix D**.

Public Interaction

Following the presentation portion of the evening, the floor was open to the public to discuss the presentations and any questions related to the technical aspects of the project.

Several public inquiries were made by the following individuals who identified themselves as:

[redacted]

The following pages include a summary of those questions and responses.

RM OF SPRINGFIELD – DOWS EAL File No. 6219.00

Summary of September 11, 2024 Open House Comments

Response Legend:

PURPLE – Friesen Drillers Limited (FDL)

RED – Associated Engineering (Sask) Ltd. (AE)

BLUE – Rural Municipality of Springfield (RMoS)

GREEN – Manitoba Water Services Board (MWSB)

	Comment and Response
1)	The diversion empties into the Floodway where the carbonate aquifer is exposed. Has that been taken into consideration? Frank Render's 1969 study looked at if the impacts from flood waters passing through the Floodway would potentially contaminate the aquifer. That study concluded that there were really no impacts. They've never seen impacts resulting from the floodway being hydraulically loading on top of the aquifer. 99% of the time the flood rate is under discharge, so the water we see in the channel is flowing away. It's not flowing into the carbonate aquifer. There's still an exposure of the carbonate aquifer in the Floodway that needs to be reviewed. Our assessment looked at the impact from the discharge into the Cooks Creek Diversion and the ultimately into the next downstream water body. Our assessment did not include groundwater interactions. Will the supplemental information be posted on the public registry? The province will decide whether the supplemental information will be posted on their website. Has a study been completed for saline encroachment into the aquifer? A lot of work has been done on this Sandstone Aquifer for this saline boundary over the last 50 or 60 years and there's never been an incident that I'm aware of. We can't say the same for the Carbonate Aquifer which had an instance in 1960. I think it was 1965 during the inlet structure, the floodway project there did cause the boundary to move. There are two existing wells, now two proposed wells and possibly more. Has there been a study specifically for the sandstone aquifer to handle this intensive draw? We did model that forward when we did our analysis. We do projective modeling forward and we could not create a situation hydraulically that would cause that boundary to move. Did the calculations for the discharge include only the first stage or the entire project with five wells? Our calculations are based on the full water treatment plant capacity.
2)	When there is low flow… do we historically know how long? … what times would be low? … Annually?... Over the last 50 years… Are we talking every week? What that means in terms of the dilution of the discharge? The retention of waste that would accumulate during periods of low flow. I just want to know

what if, if the history of flow has been?

Our assessment is based on long term flow data, and we know that ¼ of the time there is low flow. That is why the diversion is considered an intermittent stream. When there is low flow, the process waste is stored in the retention pond.

Who controls flow from the retention pond?

Release from the pond will be human controlled, via a valve controlled by the system operators. There will be reporting associated with that. Additionally, when the water plant starts up, it will be far below its full capacity and so there will be a period of years where there will be a lot less water in the pond than what the pond is designed for and holding periods can be extended.

3) How is it that we're not able to source good quality groundwater for our water system for Springfield and Dugald and Oakbank for example.

We have in this case. We have developed a groundwater supply that is high quality, but the big benefit is that it's from a confined aquifer.

My understanding is that East Saint Paul is putting in a number 10 well... And they're drawing their water from Springfield?... #9 and #10 are in the Oasis Well field, which is in Springfield... They're drawing a huge amount of water from Springfield, and we aren't able to source water in Springfield that's not complicated by reverse osmosis and greensand filtration. All they're doing is Ultraviolet light for their bacteria concerns and formation for distribution.

Municipal boundaries don't necessarily follow the boundaries of any aquifers, all groundwater and groundwater under the province of Manitoba is the property of the province and they register licenses according to The Water Rights Act. No municipality owns its own groundwater. It's all owned by the province, all of us, as citizens of Manitoba. But all of us have a role in that and that's under the act of the province.

The RM of Springfield doesn't have an aquifer to own or regulate or control, nor does the RM of East Saint Paul.

We're working with the RM of East Saint Paul, and I reviewed the report with them last week that showed their water consumption last year was a high percentage, withdrawn from their Wenzel Rd. well within their own RM.

The treatment that they utilize is UV treatment on the water, but there is no softening step. In an unconfined aquifer, you can have organics within the treated or the raw water which needs to be withdrawn. If you don't withdraw those organics, that can cause THMs which are carcinogens that can be within the treated water, and so that causes issue for the treatment steps. Going to a confined aquifer, you do not have those same concerns as you would with the unconfined aquifer. With the hard water source, individuals would have softeners within their residences and then they would be treating the water individually as opposed to at a municipal scale for hardness treatment.

Well, my understanding is that well is number 1 and #2 for Springfield and Dugald don't meet drinking water standards. Is that the case for wells, #3 and 4?

Treatment is required to meet the drinking water guidelines. In fact, all plants will have to have a treatment of some sort.

Blue Sky water bottling plant... pulling a hundred and four million litres of water.. and the possibility of even further expansion of that water source in Springfield.

	The province granted the license for the water for Sky Blue. There are a lot of water sources that are available throughout the RM and it comes down to which water source provides a combination of the ease of treatment, close proximity to the location where it will be distributed, as well as sustainability for future expansion. ... Where is the best water source, least expense and most secure? Landmark Planning in 2016, 17, 18 looked at all the available water sources and then selected this as the best one. It has been significantly examined and this is the raw water source that has been selected. I'd like an explanation of how Friesen Drillers really could propose a site on Mission Rd and have properly drilled Suthwyn Rd. that creates so many issues with the quality of the water, particularly in the adjoining properties. Water Rights licenses include a requirement to ensure that senior water rights users (individuals who have existing wells in the surrounding area) that may be impacted by the proposed development are not negatively impacted. There is a burden to the RM to ensure that they're operating the new wells in such a way as to not impact surrounding users.
4)	Blue Sky development is basically taking the water out of the ground, bottling and selling it. They don't require a large treatment plant to do that... they're not that many miles apart... one private organization can find a piece of property and drill wells on it... and not spend $40 million to treat it... here the RM is getting water that is not considered usable right out of the ground and having to spend money to build the treatment plant... Sky Blue Water project is a private company... and how they treat and sell that water is really up to them. We can't do the same with municipal water supplies which have to meet the requirements of the Manitoba Government, and it has to be treated accordingly. You're saying that the water that the RM is using... Is treated to a higher standard than what they're bottling? There is a differentiation between a bottled water system and a municipal system. The municipal system is under the Safe Drinking Water Act. A bottled water system is considered under the food, like Coca-Cola and it doesn't have the same regulations related to domestic water supply. All of the public health safety attributes that go into a water treatment plant are not necessarily required of a bottled water plant.
5)	... Cooks Creek Diversion fills up to the point where the culverts that flow underneath Highway 15 and the rail CN on the main line can't dump any water off... And the water backs up... it runs out somewhere... If you use that high flow instance to dump water out of this retention pond into the diversion, you're going to increase the length of time with the water is going to be sitting... So now you're going to take water from the pond and pump that into the Cooks Creek Diversion. It's just going to create more of a problem. You're going to have more flooding. We anticipate that the license for operating the facility will have a clause (which is standard for lagoons and ponds) that would not allow discharge when there is a flooding situation on the receiving body which is the Cooks Creek Diversion.
6)	I think it was said by Friesen Drillers that all wells should have submersible pumps placed near the bottom of the wells. My question is, will private wells have to upgrade their wells now? I think it was on one of the screens. My question is, will private wells have to now upgrade their

wells?

We usually recommend that the pump be placed at the bottom of the casing and that gives you the maximum amount of available drawdown. The Water Rights Act provides assurance that existing water supplies (IE, existing Water Rights licenses) are impacted, the RM of Springfield must rectify that, to the satisfaction of the Minister.

So any drawdown from these wells? And if they impact anybody in the area, the municipality will have to pay for any improvement?

That is correct and there is a requirement that we recommended that be placed pretty much in every municipal water supply project, a groundwater interference plan. If a resident that's nearby a municipal well has a complaint or a problem relating to what they think is from a drawdown impact, the Municipality must investigate it. And if the municipality has caused the problem, they must fix it.

My next question is, it's understandable for Springfield citizens that the municipality will have to expand its infrastructure as it grows, particularly in Oakbank and Dugald. What is not understandable to me at least, and I think others, is that in 2022 around that time there was an expansion to the Dugald Water supply and reservoir, and it was to provide for Fire Protection and existing community, till 2032. Why are we now looking at this when we had just spent millions of dollars on that project?

At the time of that project, the Dugald Water plant was theorized to be expanded to 2032. A subsequent development plan approved by Council opened up additional land in Dugald, Anola and Oakbank for development. This led to another review of the needs for the overall system and it was decided that a centralized plant was the best option, rather than two separate plants at Dugald and Oakbank, and to use Dugald and Oakbank reservoirs as additional storage. So the decision that was made in 2017 and 2018 was the right decision at that time however, with the expected growth, the plans have changed.

The earlier question about GUDI and the treatment of GUDI water East Saint Paul is using. That water in their license application, they're not putting in all this fancy extra treatment and it is still considered GUDI. So I don't understand why GUDI for East Saint Paul doesn't require expensive treatment, and yet you're telling us we need to pay for this expense.

The system in place in East Saint Paul is not removing hardness from the water, and so the water that is distributed into the system is a harder water, requiring private users to install softeners. As opposed to removing it at a centrally located plant and concentrating the elements to be discharged and regulating that out of the discharge of the water plant, each individual user is utilizing salt to draw the minerals from the water, and then that salt brine is then discharged as well in some manner. In East Saint Paul, through their wastewater treatment plant.

Was that considered for Springfield?

Yes, it was an option. Providing a softened water supply to users so they don't have to buy their own softeners is an increased level of service that requires an upgraded treatment system.

... the Dugald water system... had to blend it with 20% of Oakbank water... now be abandoning the good water that doesn't need very much treatment for this other very expensive system. Could you comment on the blending and why we're still using Oakbank water even after those two wells were done.

	For the new proposed system, we're utilizing a blended treatment. Filtered water which doesn't have hardness removed and has some iron removed from it. Blending that with the 20% reverse osmosis water, provides a balanced treated water. We're taking water from just a few miles away from where the Dugald water is coming from now and it has to be blended with Oakbank water without a reverse osmosis treatment and it's working. Why aren't we doing the same? The reason the Dugald water needs to be blended with Oakbank water is because of the fluoride. Could we not keep doing that instead of the reverse osmosis? It was an option that we explored in preliminary design to blend that Heatherdale water with water from the Suthwyn wells, but ultimately it was determined that because it is GUDI and an unconfined aquifer and the risk involved with that, that the raw water expansion would focus on the Suthwyn wellfield.
7)	I do believe that the Heatherdale wells should not be abandoned. I think that we should still shut down the operators that are causing the water to become GUDI and that this RO system is absolutely unnecessary. Are you telling me that that we are absolutely required to have a reverse osmosis system? … There's nothing wrong with the Heatherdale Wells… they're GUDI because they're being disturbed by the aggregate operators that are there. Why could you not just build a retention pond? Pump the water into there, let it settle. For a week. Pump it into the treatment center. And out to the customer rather than doing reverse osmosis. And if somebody wants to have reverse osmosis, they can pay for it and have it in their own home. If they want a water softener, they can pay for it and have it in their own home instead of putting this multimillion dollar albatross onto the RM of Springfield No, I'm not selling you reverse osmosis… The GUDI designation isn't because of the gravel aggregate operations. It would be GUDI even if they weren't there and completely shut down. Do you realize that throughout the winter we have decent water in Oakbank and then as soon as the gravel operators start quarrying again it becomes GUDI? It would still be GUDI even in the winter time. It would still require the treatment for a GUDI source and there could be impacts from the operations that you would be seeing in your in your wells. There are a number of different alternatives that you could use for removing the fluoride. We've been involved in different plants drawing from the Sandstone Aquifer, like in Landmark which has an activated alumina type filter. Our proposed plant is actually a greensand filtration plant. 80% through the greensand and only 20% through the RO. It's just a small amount that needs to go through the RO to accomplish the fluoride removal. I did also see a suggestion of a holding tank at the front of the plant however, it would still require treatment for GUDI. The tank itself would probably be over $20 million, making it a costly suggestion. I said a pond. Holding in a pond is problematic as well because it would be accessible to birds and other animals. Same as City of Winnipeg… and they're not using reverse osmosis.

	… The other question I have is the numbers… one that was dated February the 21st, 2022… one dated two days later, February 23rd, 2022… new information that the municipality has learned that that we're suddenly going to have significant growth potential and parameters and metrics… how did you determine… that we're going to have significant growth? The growth is based on a 2018 land density study that looked at all the land that's available for residential and commercial growth. From that they were able to determine that we could put 10,000 REUs on the land that is available for development. Planning and senior administration then decided to use a conservative estimate of 7,200 REUs over 20 years. When you were making these assessments, was this at the time when the Sio Silica project was hopefully going to be passed and create jobs? And we needed this reverse osmosis system to perhaps supply water to the RM because of likely pollution that Sio Silica project would cause. Is that a factor? No, Sio Silica was not a factor in the development plan. … [saline boundary] migration… both of them have their wells affected… when the pumps go on and comes into her wells that she's never had such salty water… We're still monitoring their situation. The biggest challenge with their wells was that they were constructed prior to the change of the regulation. It allowed a combined completion of both limestone and sandstone and is not allowed anymore. There are probably over 10,000 water wells in southern Manitoba that interconnect the upper and lower aquifers. A lot of these situations with water wells, they're not necessarily damaged by impact of drawdown. A lot of the times it's homeowner maintenance and things like that that come into play in those situations. It's not always easy to go and replace or repair a water well that was drilled in 1970, for example. Sometimes pumps don't come out. Sometimes the hookup doesn't meet modern standards or specifications, so that's why a lot of the times these things have to be changed. What is the consumption for the year. Where that's what is going to be produced through consumption of water for the RO. Yeah, how many homes? Does it equate to? The water treatment plant is greensand filtration with reverse osmosis for a bypass stream, based on 7200 REUs after the full build out.
8)	Expanding on… question there about population growth. According to the municipality, the need for this $30 million water treatment expansion is due to anticipated growth. Up to 200 units, residential units per year and then the associated commercial that would presumably need to be needed to accommodate this growth… average housing starts were last 10 years, was 75 homes per year… So 200 homes… why are you so optimistic about this increased growth like 2 1/2 times over the next 20 years? Again, the growth is based on a 2018 land density study that looked at all the land that's available for residential and commercial growth over the next 20 years. 200 REUs doesn't mean only residential homes. For example, the potential for a McDonald's would have used 7 REUs. We're nearing at the capacity of the existing plants, but the bigger developments cannot proceed without completion of the new water treatment plant. You're projecting for the rosiest possible picture going into the future and we know that families are very stressed financially right now and there's no indication that's going to improve in the

	near future. We're looking at a balance of in between to not be too aggressive on growth and building an even larger plant or building too small of a plant that's going to require an upgrade. We're trying to place somewhere in the middle that balances economies of scale for construction and providing growth that we're not constantly upgrading every three to five years and coming back for expansions. I don't know how you get from 75 units a year over a 10-year period to 200. All of a sudden for no apparent reason. Again, it goes back to the 2018 development plan. It also includes 800 homes in Oakbank that are currently on private wells. In the next 20 or 25 years, we'll have the capacity for them, should they choose to come on the system.
9)	Have you had a professional study done on the absorption rates from professionals, not your internal staff? That is a question for the planning department, but I don't believe a third party report has been completed. Was Friesen Drillers a proponent of Sio Silica? No, we weren't. In fact, we wrote a letter of review on two of their documents, critical of their approach. We did work for them at times, but they hired other people to do work for them as well. They know we weren't proponent. When you're looking at water treatment, basically. What is it, 180 liters per person? For fresh water. You also have 180 liters of wastewater. Where is all the high-level costing for all the wastewater facilities that are going to be needed here. The RM is engaged with a third-party consulting firm to begin expansion on the regional wastewater. What is the high level cost? High level costs right now $ 42,000,000 plus a 15% contingency, which puts it about $52 million. Why haven't you included this with the public? Been upfront, told that if you're going to have the water treatment plant, you've got to upgrade your lagoon and your water, your wastewater. Why have you not been upfront with us? The public is aware that we have to upgrade lagoon. They've known about that for three years. *Other lagoon questions not relevant to the current proposal.*
10)	… On the shale aquatard, the protective shale equator thicknesses… the 2019… aquifer feasibility… that study… spoke of a two way concentration of nitrate in groundwater and to investigate that. And they particularly you spoke of and pointed out northwest of Birds Hill Park and the area around Dugald… has a nitrate investigation been done? Not that I'm aware of, but when we make those recommendations to the municipality, it's up to the municipality to make those plans. … [the wells are] located… in the ditches and they're inside the chemical agriculture production, so we've got nitrates, you got pesticides, you've got fungicides, you've got all

sorts, including potential antibiotics and steroids, hormones from manure spreading. How will these wells be protected? Since these contaminants can go down the outer casing?

We have to work within the 99-foot municipal right of ways.

How are these protected?

Every water well according to the Groundwater and Water Well Act has to have some form of grouting. If there's an annulus present, the grouting in place has to be either cement or bentonite according to the provincial standards. That seal protects the aquifer.

One of my other questions was about the Shale protection because there's in your report you are a little leery about its viability.

The shale aquitard is it's not perfect. Naturally, it never has been.

What's the thickness?

It depends on where, but it typically ranges from six inches to 12 to 15 feet.

In the wells that you drilled?

I don't have the logs with me.

Has a rate and has a time for a travel for contaminants been determined?

Yes, in the pumping test analysis.

What is it?

I don't know the exact number off the top of my head.

What is the cumulative impact of the new well field?

Sustainable yield of the sandstone actor has not been determined by the province at this time, so that's a massive undertaking. But what we have seen from the analysis that we've done in terms of the capture zone that's there, we're not seeing any impacts from this aquifer on from that well field on this aquifer. We're just not seeing any change.

Did you do the modeling up into 50 or 100 years?

It's very hard to do that to a system that is so dominant on precipitation, so you have to be very careful with the numerical modeling and the precipitation impacts. A lot of numerical models don't have a suitable means of which of calibrating them, and the situation that you're describing in this it's not something we can necessarily calibrate as a numerical model.

In relation to the public registry comments and concerns submitted as part of the licensing process, the RM of Springfield, Associated Engineering (Sask) Ltd. and Friesen Drillers Ltd. reviewed the submissions, extracted the comments and concerns and present them below for review by Environment and Climate Change.

Response Legend: PURPLE – Friesen Drillers Limited (FDL)

RED – Associated Engineering (Sask) Ltd. (AE)

BLUE – Rural Municipality of Springfield (RMoS)

	Comment
1)	I do not support the choice of the location of the new well field. Further east, water in the Sandstone Aquifer meets or in some areas exceeds Canada's drinking water guidelines. Locating a secondary water supply in this area would provide a cost effective and safe supply. The water could be used to blend water with the existing poor quality Dugald Field or provide municipal water independently. Pipeline costs are a factor in this situation. Water supplies require some form of treatment. Multiple options for siting the new wells were considered as a part of the original well field, with each option weighed for positives and negatives before settling on the final option of the Mission Road well field.
2)	I do not support the abandonment of the Oakbank Well field. The Moosenose Aquifer must be PROTECTED from its abusers, not face potential contamination via unregulated aggregate mining. Freshwater sources are finite and rare. The Province must place protections on this aquifer and regulate the aggregate industry under The Environment Act as has been recommended for decades by numerous Commissions. Water supply from the Moosenose Ridge Aquifer will require treatment to meet surface water quality requirements. This is required due to the site being unconfined.
3)	I do not support the proposed reverse osmosis treatment plant. RO systems are WASTEFUL! RO treatment wastes water – FROM 50 TO 83% WASTE. That is… WASTE. What is USABLE is only 17 to 50% (estimates from the EPA see: https://www.epa.gov/watersense/point-use-reverseosmosissystems#:~:text=While%20RO%20systems%20can%20improve,every%20gallon%20of%20p ermeate%20produced. – accessed June 24, 2024). The WASTE of WATER is only the beginning. RO SYSTEMS require energy! This is as compared to using suitable water supplies from passive wells, which may require ONLY A PUMP and LIMITED TREATMENT, such as the water from the Moosenose Aquifer. The referenced article discusses point-of-use RO systems, such as those installed in home and businesses. The same data does not apply to large scale municipal systems. The RO system chosen for the new WTP has an 80% recovery rate. Meaning 80% will be useable water (permeate) and 20% will be waste (concentrate). RO is widely implemented as a sustainable water treatment technology across the province and throughout Canada.

4)	Recipients of the RO water from the new treatment plant will be using it to FLUSH THEIR TOILETS!... Are you KIDDING? NO ONE needs to be provided with a WHOLE HOME RO SYSTEM (!), ESPECIALLY – AT THE TAXPAYER'S (MY!) expense! This is unethical and contrary to principles of sustainable development. This is not a viable treatment method and should not even have been proposed by any sensible proponent, and at the least, SHOULD NOT BE LICENSED! As a matter of fact, the application should have been rejected on its face for even PROPOSING an RO SYSTEM for this water service, when other alternatives are available. ALL water being provided by Public Water Systems owners are required to be treated to potable water quality standards, regardless of what the end user does with it. Large scale municipal RO systems are much more efficient than residential point-of-use RO systems. Furthermore, RO is being used to treat only 20% of the raw water volume. The remaining 80% will be treated with greensand filtration.
5)	RO treatment produces a concentrated waste (ROC) that potentially poses environmental risks. The Cooks Creek Diversion is expected to mitigate these risks via dilution. What are the **impacts of release of ROC over the lifetime of the plant? Can Lake Winnipeg handle this additional pollutant load? Can the Diversion? Will residents be notified when the** concentrate is released? RO treatment wastes water. This is unethical and contrary to principles of sustainable development. This is not a viable treatment method and should not be licensed. Discharge of the concentrate has been examined through the calculations presented in the Environment Act Proposal. Calculations demonstrate that under low flow scenarios water will not be discharged to the receiving water body, and when discharged, it will satisfy the Tier II requirements of the Surface Water Quality Objectives. Discharge from the retention pond will occur between April 1st and November 15th annually based on hydraulic capacity of the Cooks Creek Diversion.
6)	No field studies were completed for the proposed development areas to identify species at risk. According to the "table top" study no amphibians or aquatic life is present. A field study must take place. If rare or endangered species are encountered who will be onsite to **identify them and take appropriate measures?** A tabletop study is an accepted method for determining whether the project area contains species at risk. The Province of Manitoba maintains a database containing that information and if the applicable environmental department identifies a need for further field study, one will take place. It is worth noting that all areas being affected by construction (farmland and road right-of-ways) are already heavily disturbed by farming and other maintenance activities.
7)	The Dugald Well field is approx. 1.8 miles from the saline boundary. Expanding this well field and increasing the draw by about two and a half times to 1,600 dam3/year makes it vital that the potential threat for saline water encroachment to the well field be assessed now. This distance is suitable for this location. The sandstone has very low transmissivity on average, so this location is acceptable. Monitoring will also be in place to confirm this. The development of the existing well field has not resulted in any changes, and the saline interface exists down-gradient from the proposed well locations.

8)	Taxpayers have had to pay to repair the water supply to the residents that were negatively impacted by the two existing Dugald wells. What costs will occur with impacts from the **additional wells and the increase in water allocation?** For an environmental review to be credible, assessment of well impacts must be included in this application not after licensing or as a condition of the license. Agreed, the Well Report has been included as part of this final submission (Appendix E) and presented at the Open House. There may be some costs to the municipality if any individual wells are impacted by the project, but at this time the exact fix and cost are unknown as no significant well disruptions are anticipated.
9)	In order for environmental assessments "to be done well, they must include an assessment of cumulative effects."(CEC, Regional Cumulative Effects Assessment Review, 2018). Cumulative effects are changes to environmental, social, and economic values caused by combined impacts of past, present, and potential future human activities and natural processes. Friesen Drillers states "the proposed expansion represents a significant development within an important regional aquifer system". (2022 Desktop Hydrogeological Study) What is the **cumulative impact of the proposed project over the next 20, 50 years?** Project impacts must be understood in their proper context. The well field expansion has been assessed at the long-term impacts and total anticipated withdrawal under the proposed project Phase 1. Any additional developments or expansions will need to be assessed and licensed at that time.
10)	The Upgrades to the Springfield Water treatment Plant will discharge concentrate at a rate of 6.0 L/s from the treatment containing fluoride levels of 4.60 mg/L to the Cooks Creek Diversion. The fluoride concentrate concentration will greatly exceed the FIGQG Agricultural and CCME for aquatic life of 0.12 mg/L (inorganic).1,2,3 In 2021, according to the EAP, the mean monthly flow in Cooks Creek upstream of the treatment plant discharge varied from 4.8 L/s to 104.7 L/s. Thus the dilution factor for Cooks Creek would vary from 6/(6+4.8)= 0.555 to 6/(104.7+6)=0.054 mg/L, assuming the initial concentration of fluoride in Cooks Creek water is much less than in the concentrate. Even at maximum average flow the fluoride concentration in Cooks Creek would be 0.24 mg/L which is above the aquatic life and agricultural guidelines. The EAP simply states there is no set tier II objective for fluoride and does not determine the combined concentration of fluoride in the Cooks Creek Diversion. The tier III, FIGQC and CCMR guidelines are ignored.1,2,3 The FIGQG Agricultural and CCME for aquatic life of 0.12 mg/L for fluoride were applied to the Vivian Sand Extraction Project. Why not to this project? The Provincial Tier II Water Quality Objectives in receiving water guidelines are applicable to these types of projects and fluoride is not included as a measurable parameter. The fluoride occurring in the discharge is from the natural groundwater at a rate of 1.6 mg/L which is above the drinking water guideline limit of 1.5 mg/L.
11)	In this project the proponent is the RM of Springfield. **Is the RM acting on behalf of the citizen's of Springfield that could be harmed by this project or in behalf of private** developers who would benefit? The proponent for this project is the RM of Springfield. The provincial water rights licensing protects water supplies to the satisfaction of the minister. It should be noted that all water rights in the Province of Manitoba are the property of the crown, to issue to the benefit of Manitobans. The residents of the RM of Springfield do not own, operate, or regulate the use

	of any aquifers.
12)	From table 2-2 in the EAP, the fluoride is removed only by reverse osmosis for 20% of the filtrate. The final blended treated water quality is 1.29 mg/L which is not much below the standard of 1.5 mg/L. No variability is given. The average initial untreated water concentration is 1.6 mg/L fluoride. The treated water would likely be above allowed levels for fluoride on occasion due to the variability of the input. To not quantify the variability in the fluoride initial concentration is negligent. There is not enough margin of safety in the reverse osmosis process for the removal of **fl**uoride. The existing Suthwyn wells were sampled in 2019 and 2022 and the fluoride levels showed negligible change in concentration. Fluoride was measured as 1.61 mg/L in 2019 and in 2022 the levels were measured as 1.59 mg/L and 1.61 mg/L. The new wells are measuring similar levels of fluoride (1.57 -1.59 mg/L) and we expect those levels to remain stable as well. Fluoride levels would have to rise by over 15% before the final treated water approaches the limit. If levels were to rise, removal through reverse osmosis will continue to be the optimal treatment technology for fluoride removal, and a potential to expand the RO capacity has been included as part of the design.
13)	Greensand filtration is proposed to remove iron and manganese but these are at acceptable levels in the raw water. Iron and manganese levels even below the limits can still cause water discolouration and scaling that may be unappealing to users. The intent of the project is not just to meet the regulations but exceed them. The treatment system chosen for the DOWS WTP will exceed those limits, providing high quality water to residents.
14)	**Why is expensive greensand filtration being planned?** Greensand filtration was primarily chosen for iron removal which ranged from 0.204 to 0.509 mg/L. It is a robust and simple treatment technology, well suited for iron removal at varying concentrations. Greensand filtration is also excellent for manganese removal. Raw water levels are low enough that it is not specifically being targeted but removal to near zero is an added benefit, especially considering the known neurological effects of manganese. Of all treatment types considered, greensand filtration is a very economical approach to this groundwater.
15)	The locations of the new wells could be chosen to be where domestic well density is small. The ultimate capacity of the treatment facility is given as 120 L/s. The Facility is to operate at least 20 hours per day. Thus the well demand could be over three million cubic meters per year. A well sustainability study for this project is required and must not be the subject of a separate project. A sustainability study on the e**ff**ect of the required new wells further east would also be required and should not be part of a separate EAP. The ultimate WTP capacity of 120 L/s over a 20-hour day does not mean the WTP will produce that amount of water every single day of the year. Rather, WTPs are sized to meet Max Day Demand, which is 2x the Average Day Demand, to ensure the WTP is capable of meeting

	demand during sustained, high use periods such as droughts. At the ultimate plant capacity of 120 L/s, the annual raw water demand is based on average use and is expected to be ~1.6M cubic meters (1,649 decameters). The well study has now been included as part of the submission.
16)	Drawing of water for gardens and irrigation is common on Cooks Creek and the Diversion. How do the people living along Cooks Creek feel about the water in the Diversion being polluted with fluoride? The information provided and results of the open house event on Aug. 29, 20023 and the invitation event on December 14, 2023 were not disclosed in the EAP. The information that fluoride guideline levels would be exceed in the Cooks Creek Diversion could not have been made available at these meetings since these exceedances were omitted from the EAP. Similarly, since no variability analysis was done on the fluoride levels, the public would not have been informed about the possibility of occasional exceedances of allowed fluoride levels in the treatment plant drinking water. Similarly the public would not have been informed about the risk to domestic wells near the floodway to fluoride contamination. Was the public informed about the amount of increase in local taxes required for funding the water treatment plant upgrade? Was the public informed that moving the wells east could result in no requirement for a water treatment plant upgrade and no resultant tax increase? A discussion of this nature was not reported in the EAP so likely did not occur. The Provincial Tier II Water Quality Objectives in receiving water guidelines are applicable to this type of project and fluoride is not included as a measurable parameter. The discharge of the system will occur in near proximity to the lagoon system which will return the water to near similar chemistry as the original groundwater.
17)	Can Lake Winnipeg handle this polluted load of RO Concentrate? Associated Engineering reviewed data from the Red River near Selkirk and determined that discharge concentrations remain below the Provincial Tier II Water Quality Objectives in receiving water guidelines. No detriment from the discharge is anticipated. See additional information submitted as Appendix F.
18)	Under previous agreements the RM of East St. Paul has two primary wells in the RM of Springfield's Moosenose aquifer situated an approximately 2.5 miles west of the Heatherdale wells nudging on the eastern edge of the Red River Floodway This water supply supports residents drinking water needs in East St. Paul and is of the highest quality with no requirement to aggressively treat its Moosenose water supply. NOTE: the RM East St. Paul is in the process of commissioning a third well in the Moosenose to meet its increased demand for residential drinking water. The wells completed into the Birds Hill complex were decommissioned several years ago. The RM of ESP currently operates wells completed into the Carbonate Aquifer.
19)	This is the most glaring and current example of political influence. It seemingly illustrates concerns the public should have regarding corruption involving the past conservative provincial government and conservative leaning municipal elected councillors. We cannot speak about corruption etc. Comment is not applicable to the EAP submission.

20)	Also supporting our argument of political influence is that the RM of Springfield's one Provincial grant does not seem to have had an application to the Province for financial assistance for a new RO water treatment plant, yet $5,650,000.00 was received in advance and prior to work done or approval. This Provincial grant application was not applied for and processed through normal channels at the province. It appears to have been driven by MLA and past minister Ron Schuler through cabinet for approval. Comment is not applicable to the EAP submission.
21)	On the future well development is required to supply water for the additional Stage 1 WTP capacity (80 L/s), as well as for the ultimate Stage 2 capacity (120 L/ s). Therefore, these future wells will need to be installed to meet the region's future raw water needs." (p8, EAP) It is concerning that effects from the proposed wells are not being considered in this EAP. The EAP clearly indicates the proposed wells are "required to supply" the plant. ***How is "construction** of the new raw water" and "e**ffe**cts res**ulting from these wells considered out of scope"? Provide justification.** The EAP related to the WTP and associated pipelines is Associated Engineering's scope of work whereas the well investigation and development is by Friesen Drillers Ltd. The submissions were handled separately in order to maintain the preliminary project schedule. This was discussed and accepted by the province at the time of submission. The report by Friesen Drillers Ltd. was completed recently and is being submitted as Appendix E.
22)	An assessment of well impacts must be in this application in order to confirm the viability of the project. Appendix A, Friesen Drillers 2022 Desktop Hydrogeological Study Dugald Raw Water Field Phase 2 Expansion (DHS) states "the proposed expansion represents a significant development within an important regional aquifer system" (p10) and lists a series of "field testing analysis and well construction activities [that] should be undertaken." Delaying the consideration of important information on the project's impacts until after a license is issued is unreasonable and goes against best practice standards for environmental assessment. Project Splitting has been highly criticized by several Commission reports including the recent Sio Silica Extraction Report. *We do not agree with splitting the effects of the wells from the proposal. Effects from these wells must be considered in this license application for an evidence based decision. *It is crucial to know that the area can be safely developed without **negative impacts to the groundwater system and neighbouring wells in this** proposal. *Why are these wells excluded from assessment in this Proposal? Who made that decision? The effects of the groundwater withdrawal have been considered by Friesen Drillers Ltd., and presented in the report submitted as an Appendix E to show the anticipated impacts of the groundwater withdrawal. Limited impacts are shown to be anticipated from the project, and if surrounding users are shown to be impacted from the increased withdrawal, the Municipality will repair or replace the wells with a suitable solution to mitigate the impact.
23)	For completeness, well installation activities and plans will be described, however these effects will be considered in a Notice of Alteration to Licence No. 3303. (p.6) "withdrawal of the water from the new wells will be considered out of scope and submitted separately… Therefore, environmental effects resulting from these wells will be considered in the

	subsequent proposal."(p.7) The proponent (our RM and Manitoba Water Services Board) is unclear how environmental effects from the wells will be considered in the licensing process. ***EAP or NoA? Has this been confirmed by the Province? Provide the record and rationale.** The effects of the groundwater withdrawal have been considered by Friesen Drillers Ltd., and presented in the report submitted as Appendix E to show the anticipated impacts of the groundwater withdrawal.
24)	**What additional fees will taxpayers incur for a "subsequent proposal"?** * If the Province refuses to review the effects in this Proposal and allows a NoA, it must be deemed a major alteration to ensure for a transparent and accountable public process. The public deserves to participate, have a say in development, and understand impacts. NoAs do not allow for that. Neither does project splitting. * Several Commission Reports have recommended the Manitoba government establish and require higher standards of performance in environmental assessment. We request the Province postpone any licensing or finding respecting this application and order the municipality and the Manitoba Water Services Board to include an assessment of the well expansion in this proposal and provide additional comment period for the TAC and public. The report by Friesen Drillers Ltd. was completed recently and is being submitted as Appendix E. Friesen Drillers Ltd.'s submission has met the requirements of the Groundwater Exploration Permit of the Water Right Act, and the additional fee has been saved.
25)	The RM's 2019 EA Proposal for the Dugald Well Field - Supplemental Municipal Groundwater Supply (EAL License #3303, Appendix A, EAP) - lists a series of work that was carried out prior to filing: Groundwater Exploration Permit, design/install 2 - 12" diameter production wells, complete well development, short term specific capacity tests, 24 hour pumping test and 1 day recovery, monitoring to include groundwater quality samples for isotope and geochemical analysis, and use approx. 15-20 observation wells during testing, complete a detailed report of technical investigations and public consultations and "Depending on test results, prepare an Environment Act proposal for the project." (p4, EAP file#6013) 1 *We recommend that this precedent be followed in this application to provide for critical information on the proposed project and allow for evidence based decision making. May 2024 Springfield Water and Waste Monthly Report states drilling occurred "week of January 22, 2024…for the purposes of confirming well yield capacities and groundwater monitoring baselines". March 4, 2024, a 72 hour pump test was performed, impacts to neighbouring residents occurred. A report was prepared and presented to Council. The EAP was filed March 14, 2024, and posted May 14, 2024. *Why is the proponent going forward without full disclosure? https://www.gov.mb.ca/sd/eal/registries/6013springfield/EAPspringfield.pdf Draft4 May 2024 Water and Waste Report reproduced: The proponent through Friesen Drillers Ltd. has provided all the information that is required as an Appendix E to this document.
26)	Cumulative Effects: In their 2018 "Regional Cumulative Effects Assessment Review" the Clean Environment Commission (CEC) asserted "Environmental impact assessments consider the impacts of an individual project or activity but, in order to be done well, they must also include an assessment of cumulative effects."(p7). *Will the province ignore

	recommendations and allow this "significant development" to disregard cumulative effects? Provide rationale? *What is the cumulative impact of the project over the next 20, 50 years? Project impacts must be understood in their proper context. Additional information has been appended. The well field expansion has been assessed at the long-term impacts and total anticipated withdrawal under the proposed project Phase 1. Any additional developments or expansions of the withdrawal will need to be assessed and licensed at that time.
27)	Watershed Plan: The Southeast Regional Groundwater Management Plan (SRGMP) identifies a number of unknowns in both aquifers (carbonate and sandstone) including rates of recharge, movement of the saline and brackish groundwater into freshwater zones and sustainable yield. The Dugald well field and potentially the proposed wells are 3.0 km/1.8 mile from the saline boundary however the EAP does not discuss the potential for boundary movement. *Has the Province implemented the SRGMP? Provide status of the Plan. *Why has the proponent ignored the SRGMP in the EAP? *What impacts will the project have on the saline boundary? Sustainable yield? Recharge? The SRGMP was never completed to our knowledge. The modeling effort of the aquifer was never completed, and a final report was never issued.
28)	TAC comments for the 2019 Dugald Well Field express concern for "Saline water Encroachment". The EAP expected the radius of influence to be 1.4 km (0.8 mile) from the Boundary. TAC criticized the depiction of the boundary as a single line when "in reality, groundwater quality changes gradually" and recommended site specific hydraulic parameters to calculate the radius of influence and "evaluate potential threat (long term) for saline water encroachment to the proposed production well." *With the proposed expansion to the existing Dugald Well Field and an increase in water allocation, evaluation of saline movement is critical to this EAP. Confirmation of the viability of the project should be dealt with in this license application. The 2007 Pembina Valley Water Cooperative Supplemental Groundwater Supply System Proposal addressed a "50L/s" draw and "Depending on future needs, approvals to expand the system would be applied for if and when they are needed." The CEC found "insufficient information available in respect of the sustainability of the water resources". The Commission recommended the "MB govt take the lead and make the development of an integrated watershed plan for the Manitoba portion of the Red River Basin and the associated aquifers a priority." Since 2007, successive Manitoba governments have failed to follow recommendations. Manitoba Clean Environment Commission Report - Pembina Valley Water Cooperative Supplemental groundwater Supply System, "In the absence of an integrated watershed and aquifer plan for the Manitoba portion of Red River Basin, that an Environment Act license not be issued for the Project." p50 *Without this critical information it is difficult to determine the true impacts of the proposed project and that it will not compromise the sustainability of the aquifer system. Kennedy and Woodbury in developing a model for the sustainability of the carbonate and 3 sandstone aquifers, stated: "a lack of a coordinated model over the entire populous portion of Manitoba has led to a gap in predictive capabilities…With increased population and development it is most likely that the stresses on the groundwater system will continue to increase. To account for this increase in stress, the domestic pumping rates were increased…by 2% every five years (comparable to population increase)…over a 20-year period…In terms of sustainability, there remains a region where the heads dropped below the top of the aquifer and where dewatering may occur. Note also the

percent of recharge taken by well extraction has increased to 55% from the base sustainability case. This value is greater than the maximum suggested value of 50% of **recharge, indicating that the system is no longer sustainable."** *A project's draw/impact on the aquifer system must be analyzed over the entire system as shown in the Kennedy and Woodbury model.

"The Project will increase water treatment capacity to account for future population growth and community development. The capacity of the facility is being designed based on a 20-year phased growth projection." (p.6 EAP) "The Project is being designed to meet the Max Day Demands over 20 hours of operation…the required ultimate treatment capacity is 120 L/s. As this is based on growth assumptions, it will be achieved through a phased approach."(p3 EAP) "it is desirable to have new pumping wells operate consistently and to increase pumping gradually to allow natural systems and existing infrastructure to respond to the new conditions and stresses. Consequently, an expansion of allocation for the current supply wells should proceed on the basis of the ongoing monitoring results and the recommendations that are generated from the monitoring data analyses."(p9,DHS)

*Licensing the well expansion and plant without assessment is not supported. 120L/s at 20 hours per day for 365 days is 3.15 million cubic meters per year.

The ultimate WTP capacity of 120 L/s over a 20-hour day does not mean the WTP will produce that amount of water every single day of the year. Rather, WTPs are sized to meet Max Day Demand, which is 2x the Average Day Demand, to ensure the WTP is capable of meeting demand during sustained, high use periods such as during droughts.

At the ultimate plant capacity of 120 L/s, the annual raw water demand is expected to be ~1.6M cubic meters (1,649 decameters).

Regardless of whether this is achieved via phased approach to allow for system adjustment, the sustainability of the aquifer on a larger scale must be determined in order for "predictive capabilities". As demand on the aquifer increases and more wells are drilled (private and public) the burden on the Aquifer system will simultaneously grow. Our government can no longer ignore recommendations. This project must not be approved until the required data is collected. 3 Sustainability of the Bedrock Aquifer Systems in South Central Manitoba: Implication for Large-Scale Modelling. Paula L. Kennedy, Allan D. Woodbury. Canadian Water Resources Journal Vol. 30(4): 281-296 (2005).

This is a Ph.D. study that was undertaken a number of years ago. It is a numerical modeling study, that is largely a simulation of the conditions that were present at the time. It was a reasonably good study, although it was not perfect by any means. Numerical modeling studies are often this way. Many of the conditions that have been presented in this study did not occur over subsequent time. In order to fully understand these situations, one cannot just focus on the one study that provides some comments that may fit someone's approach. One must read all the available information on an area to form the basis of an opinion. The hydrograph data present in this area largely doesn't support the claims made in this modeling study.

29) Has the government developed an integrated watershed and aquifer plan to allow for sound **licensing of development of the aquifer per CEC recommendations? If not, please provide rationale.**

*Springfield will apply to increase water allocations to 1.6 million cubic meters per year. (p3, DHS) **The above calculation for "the required ultimate treatment capacity" is 3.15 million**

	cubic meters per year and appears to put Springfield over allocation limits. Please clarify? The ultimate WTP capacity of 120 L/s over a 20-hour day does not mean the WTP will produce that amount of water every single day of the year. Rather, WTPs are sized to meet Max Day Demand, which is 2x the Average Day Demand, to ensure the WTP is capable of meeting demand during sustained, high use periods such as during droughts. At the ultimate plant capacity of 120 L/s, the annual raw water demand is expected to be ~1.6M cubic meters (1,649 decameters). *Well assessment and sustainability must be included in this application. Water Source "Raw water will continue to be supplied from the Winnipeg Formation Sandstone Aquifer…The new raw water well field will be located south of the Dugald Raw Water Well Field."(p.7 EAP). The DHS "predicts that the Raw Water Quality of the three (3) proposed wells will be of similar or better quality than the existing Suthwyn Wells. Until water quality data is available, treatment strategies are based on the available data (existing Suthwyn Wells only). The key parameters identified above are Fluoride, Sodium, and Total Dissolved Solids."(p.9 EAP) "The water quality in the Sandstone Aquifer also tends to improve in the east-southeastward directions, which will likely provide further benefit for the water treatment process."(p9, DHS) Analysis of Water from the proposed wells must be completed. Supplemental information regarding the wells is being submitted to the province under this application as Appendix E.
30)	If Water is "fresher" and does not require RO treatment then the plant is not necessary. The proposed location or locating the proposed wells further east-southeastward may produce water that can be used to "blend" with the existing Dugald wells to meet drinking water guidelines that presently occurs using the Oakbank well field water. Or, provide municipal water independently. *Why were new wells drilled directly south of the Dugald well **fi**eld(Suthwyn Wells) and not east-southeastward? *Has an independent water source further east-southeast been considered? The EAP states "Until water quality data is available, treatment strategies are based on the available data (existing Suthwyn Wells only)."(p9). Springfield Water & Waste Report, May 2024, states "Friesen Drillers Ltd. onsite with WWD the week of January 22nd to undertake drilling of the observation wells and the production wells for the purposes of confirming yield capacities and groundwater monitoring baselines". ***During drilling operations was** water quality tested? *We recommend that review be suspended until water quality data is provided to confirm treatment/concentrate parameters and that TAC/Public comment time frame be extended to include this vital information. The Oakbank Well Field draw from the Moosenose aquifer is "classified as GUDI (Groundwater Under the Direct Influence of Surface Water)[sic] due to the wells' proximity to a large, deep gravel pit…the RM of Springfield intends to discontinue use of these wells at some point in the future and therefore, will be unavailable as a raw water supply for the new WTP."(p3, EAP) "designated as GUDI, ultraviolet (UV) treatment is required for primary disinfection and chlorine for secondary disinfection, and no other treatment methods are necessary."(p4,EAP) *Provide evidence to support the decision to abandon the Moosenose aquifer due to influence of a nearby surface water body. Is there a shown failure of UV and chlorination treatment? ***Has there been contamination from the identified high risk activities in the** past two decades? Although deemed GUDI, Water from the Moosenose is of such quality that only UV treatment and chlorination is required. The Water from this unconfined aquifer was initially drilled to supply Dugald residents because of the poor water quality in the Dugald

	area. Supply was then brought into Oakbank. This unconfined Aquifer continues to provide good quality drinking water for the two communities and private well owners. *Is **abandonment the only option available?** Choosing this option displays a complete lack of respect to the environment and citizens. This viable, freshwater Aquifer should be protected, not abandoned. The wells were drilled to the south, as this is the natural progression of the formation of the aquifer. Moving east/southeasterly is the best approach in this case. Friesen Drillers Ltd. is independent of the RM. We are certified to conduct these types of investigations and have the credentials to do so. The proposed well sites were selected through a detailed process examining all potential options for the supply of the system in consultation with residents as far back as 2018. The well site locations selected to move forward with were the best combination of location with proximity to service population, water quality, water quantity, sustainability, and future expandability.
31)	The Oct 12, 2017 Engineering Report to Council on the New Well Field Design[existing 2 wells] and Construction states "there is room for drawing water up to 500,000 cubic meters annually from the Moosenose Ridge aquifer (Friesen Drillers report 2016) by drilling additional wells, however, due to close proximity to the gravel pits, where currently under water mining is in operation, there is a risk to the raw water supply in case of any chemical or oil spill happens in the pits. Secondly, there is only one raw water line from the wells to the Water Treatment Plant (WTP) which is another risk." Although the following series of questions may be construed as out of scope, we would appreciate answers. *Was "under water **mining"/dredging permitted at locations and depths that would put the water supply at** risk? If so, provide records of approval. *Is maintenance performed on the raw water line? **How often? What does maintenance involve? *A single supply line is identified as a "supply** risk" however the proposal does not seem to include redundancy throughout the pipeline system. Is there a planned twinning of the system to all points? Cost? RM Springfield has the established right to the aquifer's water under The Water Rights Act. The RM has priority over "industrial purposes". Many of the statements here are factually incorrect. Risk is managed through adequate sizing of reservoirs to allow servicing of the pipeline in a timely manner to prevent almost all outages. Emergencies do occur and are not completely preventable in a fiscally prudent manner, but manageable.
32)	In 2017, Friesen Drillers analyzed data and calculated the radius of influence for 12-hour pumping and recommended an approximate 2,450 foot diameter Well Protection Area for the Oakbank well Field. An "area around the wellfield with geologically unconfined conditions" 4 was also recommended for inclusion in the protection area.(p56, Fig 39) Management strategies were also "recommended to reduce the potential for impacting the municipal supply wells" and review with land owners and quarry operators in the protected area. Emphasis on proper handling and disposal of hazardous waste was "especially important within the gravel quarry areas."(p57) p56, Aquifer Capability and Groundwater Vulnerability Study – RM Springfield Friesen Drillers 2019 Draft 410 "High risk land uses such as landfills, lagoons and heavy industry should not be located within groundwater sensitive areas without suitable protections put in place."(p38**) *Has the RM implemented the Well Protection Area?** *Has the RM implemented management s**trategies? When? How often? Enforcement?**

***Does the RM permit aggregate dredging operations to occur within the Oakbank Well field** zone? What are the parameters? *Did the RM order "site specific hydrogeological **investigations" of aggregate operations as recommended when any high risk activity is undertaken in the High Vulnerability groundwater sensitive areas.(p40). Please provide.**

The RM of Springfield has not implemented the Well Protection Area as a fully detailed study to create, define and impose the WPA will be both lengthy, costly and time consuming; with that, the RM is moving its raw water well supply away from the unconfined Moosenose Aquifer which negates the need for the Well Protection Area. The RM does not interject on aggregate operations as aggregate operations are regulated by the Province of Manitoba Mines Branch.

33) Environmental licensing of quarry operations is long overdue. When is the Province **implementing recommendations to regulate quarry operations under The Environment Act?** The Manitoba Water Protection Act recognizes "an abundant supply of high quality water is essential to sustain all ecological processes, life-support systems and food production, and is paramount to the environmental, economic and social well-being of Manitoba now and in the future" and "access to sufficient, safe, acceptable, and affordable water for personal and domestic uses is internationally recognized as a fundamental right of citizens" and "to most effectively ensure that drinking water is kept clean, safe and reliable, it is necessary to compliment provisions of The Drinking Water Safety Act with additional measures to protect drinking water sources". *Protecting this aquifer as a drinking water source conforms with present legislation and makes ethical and economic sense. Section 5(1) of The Water Protection Act allows the province to designate the Oakbank Well Field and potential expansion of the Field in the Moosenose Aquifer, a water quality management zone for the purpose of protecting drinking water sources. *Will the province designate the Oakbank **Well Field and potential Field expansion as a water quality management zone under The Water Protection Act? *Will the Province prohibit/place restrictions on aggregate mining** near the Field? *Good quality water sources are precious, finite and rare. Will the Province act on the dec**ades of recommendations from Commissions and their own department staff** and **fi**nally legislate Quarries under The Environment Act? There are private well owners that are drawing from the Moosenose Aquifer. *How will these users be protected? What will be their fate? It is disturbing that the RM of Springfield is willing to abandon this good quality freshwater source and area residents. It is equally disturbing and appalling that the Province has not acted to protect this precious, finite, freshwater source. We trust our new Government will.

The Province of Manitoba Government and Mines Branch is best suited to provide a response to these questions and concerns.

Water Wastage According to Environment Canada statistics, only 10% of residential water is used for drinking and in the kitchen. US stats show only 1% of piped water is used for drinking and cooking(Cotruvo et al., 2016) . The remainder is used for bathing, laundry, cleaning, filling 5 pools, hot tubs, water features, skating rinks, street cleaning, irrigating lawns and gardens, heating and cooling systems. In addition, the proposed treatment plant will also provide treated water to wash cars/trucks and to fight fires. *How is this a bene**fi**cial, economic, ethical use of an already wasteful, costly, treated water resource? *Would it not be economical and **better suited to have home RO systems installed in each home to provide for drinking the** Dugald water if desired?

ALL water being provided by Public Water Systems owners are required to be treated to potable

	water quality standards, regardless of what the end user does with it. Large scale municipal RO systems are much more efficient than residential point of use RO systems. Furthermore, RO is being used to treat only 20% of the raw water volume. The remaining 80% will be treated with greensand filtration. Cotruvo, J.,Kimm, V. and Calvert, A. 2016. "Drinking Water: A Half Century of Progress." EPA Alumni Association.12 "an important aspect of groundwater quantity is the increased efficiency of groundwater use and the reduction of per capita water demand. This can be achieved through groundwater conservation strategies, regulations and policies that integrate water efficient/conservation technologies and practices, and public education initiatives." (p51, RM Springfield Aquifer Capability and Groundwater Vulnerability Study) RO is contrary to water conservation, principles of sustainable development, and the above commissioned Study. RO will be used to treat only 20% of the raw water volume.
34)	The Plant proposes to produce 6 litres a second of concentrate amounting to 189,216 cubic meters a year. This is equal to 75 Olympic pools of RO concentrate containing toxic heavy metals, reject minerals and total dissolved solids. This water is wasted and discharged into the Cooks Creek Diversion. ***What rationale is there for using RO water in today's** understanding of current climate impacts? *Does RO treatment meet MB Water Services Board mandate for the development of sustainable water and wastewater works? RO will be used to treat only 20% of the raw water volume. At 80% recovery, that means 65,960 cubic meters of concentrate will be created per year, factoring in average flow instead of peak flow.
35)	Protection of the Moosenose Aquifer is vitally important. "Water conservation measures can include metering of water use in the future and any water conservation information will be posted or included in community bulletins." (P28, EAP) This "Water Conservation" snippet was appropriately inserted upside down in the EAP, along with a couple of other doozies. *Using water meters to charge customers and info bulletins to reduce water consumption and at the same time propose a wasteful, costly treatment system that produces a deleterious waste product (ROC) is contrary and insulting. "Potential leak detection will take place through monitoring flows leaving the WTP and water levels in the reservoirs. Any leaks should be repaired in a reasonable time to avoid excessive water loss and associated costs."(p28, EAP) ***How often is monitoring of flows leaving and levels in reservoirs performed? *Define reasonable repair time?** Reservoir levels and flows leaving the water treatment plant(s) are monitored via SCADA System by the Utility 24 hours a day, 7 days a week to ensure reliability and performance. A reasonable repair time by the RM is twenty-four (24) hours after first notice of an issue / leak.
36)	Concentrate and the Diversion "Concentrate effluent from the WTP must be able to pass the LCS0 acute lethality testing on appropriate species. To accomplish this, the concentrate water quality must meet all effluent requirements stipulated in Manitoba Water Quality Standards, Objectives, and Guidelines."(p17, EAP) *Although provided with the "Tier water quality objectives" we are not provided with the methods used to ensure these objectives are met. What are they? "A concentrate water retention pond will be used to seasonally store the concentrate during low flow months and winter." (P11, EAP). *How are water levels **maintained in the retention pond to prevent overflow during winter and low flow months?**

***What protections are used to prevent wildlife from gaining access to the concentrate?**
***Will residents be notified when the concentrate is released?**

The retention pond will be sized for the required storage volume, including additional depth to minimize overflow potential. At this time, it is not expected to be restricted access (IE, no fence). Winter storage will be discharged to the environment via manual opening of a valve, only to occur annually between April 1st and November 15th.

"Following winter storage, it is estimated that concentrate water will be discharged into the Cooks Creek Diversion at a flow rate of 29 L/s for three (3) weeks in April. Combined concentrations have been calculated based on these three (3) weeks of discharge and complete mixing. Following these three (3) weeks, the concentrate water will be continuously discharged through a gravity fed pipe from April 1st to November 15th, and the flow rate will be reduced significantly."(p21) *Please clarify the volume schedule of the discharge purge for the three weeks in April at 29L/s (459 GPM) and then from April 1st onward the **fl**ow rate is reduced?

At the ultimate WTP capacity, the storage period of November 16th to March 31st is equivalent to 137 days or 62.6 dam^3 of process waste. The retention pond will be sized to store at least 182 days (6 months) of process waste or 83 dam^3, to ensure there is adequate capacity for extended holding periods due to low flow in the Diversion.
The estimated flow rate of 29 L/s for 3 weeks allows discharge of the winter volume in a controlled manner, to ensure adequate mixing/dilution in the Diversion. The duration also aligns with discharge from the upstream lagoon which will further aid in ensuring there is adequate flow to aid in mixing/dilution.

Following the initial spring discharge, flow will either be reduced to continuously discharge at the same rate process waste enters the retention pond or, will be stopped until late summer or early fall when there is adequate flow in the Diversion.

The Cooks Creek Diversion works to provide flood relief to the region's agricultural lands. Depending on snow volumes and spring precipitation, the Diversion is often at maximum capacity. This is also compounded with the restructuring of the Donaldson Drain "to accommodate increased flows from PTH 12" and runoff from the newly located Springfield 6 snow removal site to the old Dugald Lagoon site. *How is discharge achieved during maximum **capacity in the Diversion? *Has the potential for an extended maxi**mum capacity period in the diversion been considered? How does this a**ff**ect discharge? *Can the structure of the **Diversion handle this additional load? *What measures will be taken if the Diversion** over**fl**ows due to increased loading from the concentrate? Will the RM (taxpayers) be held responsible?

The retention pond design will include additional storage capacity. If the Diversion is at max capacity, discharge can be delayed until there is a suitable reduction in flow.

Cooks Creek and the Diversion contain water that has passed through agricultural lands and would likely contain agricultural contaminants such as pesticides, herbicides, fungicides, as well as elevated nitrate levels. Runoff from the new Springfield snow removal site will potentially contain road salt, petroleum hydrocarbons, and other contaminants. Due to growing conditions, chemical applications will vary. Snow melt will also play a role in the Diversion water quality. Water quality samples for Cooks Creek were taken July 7, 2022, and provided in Table 2-3. Although fluoride will be above allowable levels in the concentrate, Fluoride was not measured nor nitrates for the receiving body. *Please provide a series of detailed water quality analysis for the receiving water body between April - Nov. Include Fluoride and

Nitrate. *Have these contaminates been considered in the ability to effectively dilute the concentrate? * Is there potential for chemical interaction with concentrate? *Cumulative effects of release? *Impacts of release over the next 10, 20 years?

The Provincial Tier II Water Quality Objectives in receiving water guidelines are applicable to this type of project and fluoride is not included as a measurable parameter.

Nitrate is a Tier II parameter, with a discharge regulation limit of 10 mg/L. Based on the available data and our process waste concentration calculations, nitrate levels in the Diversion are expected to remain below 1 mg/L. See Appendix F for further details.

Cooks-Devils Creek Integrated Watershed Management Plan p22 14 "The sampled location is located upstream of the proposed development, 1 km south of Millbrook Road, Sample Station No. MB0SOJS007. Samples were taken on July 7, 2022, and were provided by Government of Manitoba's Environment and Climate Change, Water Science and Watershed Management Branch, the Acceptable Use Letter is attached in Appendix F."(p.11, EAP) The Cooks Creek sample may not provide for a true analysis of surface water in the Cooks Creek Diversion. *Provide new samples within 100 meters upstream from the proposed "new Oakbank Diversion Drain that will be constructed adjacent to the WTP" outlet. These must be taken **April thru Nov to better reflect conditions and viability for dilution of the concentrate. Include fluoride, Nitrate. Our continual reliance on dilution to reduce chemicals and toxins in the** environment is unacceptable.

The sample water quality provided by the province is the most comprehensive available. A single sample taken on a single day provides data for that moment in time only and would not be an accurate portrayal of the actual conditions.

At some point, the very water bodies, land and air, we rely upon to dilute our worries away to 'acceptable' 'registered' 'guidelines' will require dilution themselves! We can see what our reliance on using dilution as a mitigation has done to Lake Winnipeg where this concentrate will ultimately flow to. ***If discharge does not comply with objective standards for release, what method(s) are used to bring discharge to meet allowable levels? *During drought conditions,** will raw water be used to dilute the discharge to allowable levels? At what required volumes? *If this is not possible, what emergency measures will be implemented? *Provide analysis of **potential environmental impacts from undiluted concentrate release. *How often is the effluent tested to ensure compliance with objective standards? *What is the density of the** concentrate? Can concentrate pool and remain in depressions in the Diversion? Has the **retention of concentrate in the Diversion been assessed? *What are the impacts of release of concentrate over the lifetime of the Plant? Can Lake Winnipeg handle this additional** pollutant load? Can the Diversion? *We recommend the province test the Diversion and the **concentrate to ensure dilution is possible to meet objective standards for release?**

Associated Engineering's review has confirmed the discharge meets the Provincial Tier II Water Quality Objectives for the receiving water. The issued license will include requirements for semi-annual or annual effluent testing.

*If this proposal is somehow licensed, monitoring data must be made publicly accessible on the Public Registry. "Although groundwater is not expected to interact with the in-scope Project activities, measures will be implemented to reduce potential impacts. These measures include having a qualified contractor compete[sic] the construction and installation of the wells and concentrate water pond liner specifically. This includes following applicable

legislation/permits/approvals and implementing a quality assurance program." Both Cooks Creek and the Cooks Creek Diversion discharge into the Red River. (p.16, EAP) Concentrate will discharge to the Red River Floodway via Cooks Creek Diversion. The Carbonate Aquifer is exposed throughout the year in the floodway. Discharge of the concentrate into the exposed Aquifer has been overlooked. ***What impacts may occur from contamination of the exposed** Carbonate Aquifer in the Red River Floodway from the concentrate? Over 10, 50 years? *If **release of concentrate is not possible during drought/low flow conditions, will release into** the **fl**oodway occur under emergency order? What e**ff**ects will occur?

There is no expected impact to the Carbonate Aquifer in the Red River Floodway as per commentary provided by Friesen Drillers Ltd. at the September 11th, 2024 Public Consultation.

"Concentrate water will be released to the Cooks Creek Diversion, just south of the WTP Project site. As previously discussed, impacts to water quality form[sic] the release of concentrate is expected to be negligible. The proponent may choose to conduct long-term monitoring of the Cooks Creek Diversion upstream and downstream of the drainage point to assess any long-term impacts on water quality." (p.27, EAP) *Will the RM hire a contractor? Costs? We recommend this be carried out by the Province and made publicly available on the Registry.

Water quality samples required under the approved license is typically performed by Owner personnel (IE, RM staff).

*If somehow this proposal is approved, long term monitoring is a must. *If monitoring finds long term impacts on water quality, what then? Damage is done. Safety "The concentration of nitrate in groundwater should be investigated further. This includes the area northwest of Birds Hill Park and the area around Dugald. The analysis of groundwater samples should include an isotopic analysis of nitrogen and oxygen to assess the potential sources of nitrate. The sample locations should also seek to delineate the lateral and vertical profile of the apparent nitrate plumes. Sampling should be conducted on an annual basis to assess potential plume migration and identify potential changes over time."(p59 Springfield Aquifer Capability and Groundwater Vulnerability Study, Friesen Drillers 2019) There are valid safety concerns with the location of the wells since they are located in ditches and adjacent to chemical agricultural production. ***The wells are susceptible to agriculture runoff as contaminates could be dr**awn via the outer casing due to drawdown from intensive pumping. Table 1-2 provides analysis of the Dugald Well Field raw water quality. Nitrogen/Nitrate levels for the two wells are not provided. Since this is a public drinking water supply system, are not regular Nitrate measurements required under The Drinking Water Safety Act. *Has the RM tested for Nitrate? At what intervals? *Provide Nitrate analysis for the past 3 years.

Nitrate and Nitrite are typically included in all general chemistry water quality lab analyses. In 2019, both were below the detectable limits. In 2022, Well #1 measured 0.0056 mg/L nitrate and Well #2 remained below the detectable limit.

***Has a well field protection zone been established for the Dugald well field? *How are the** proposed wells protected from agricultural machinery? Accidents? Vandalism? Flooding? Currently, they are not. *Can the RM/taxpayer be held legally responsible for damages to the **well and machinery? Contamination?** Although the wells are drilled into the deeper Sandstone Aquifer "the hydraulic separation between the bedrock aquifer is not guaranteed at all locations. Therefore, diligence must be maintained in the groundwater protection and monitoring requirements."(p4,DHS). *Define groundwater protection and monitoring requirements and enforcement for the Dugald well field. ***Is there potential increase in**

vertical flow from the upper aquifers due to fractures occurring during construction of transmission towers? Out of scope? "The available information for the supply wells and local aquifer suggests that the annual allocation of the existing well field could potentially be increased in the future. However, concerns for third party interference were noted for the existing sites." (P7,DHS) Operation of the existing Dugald Well Field created well interference to area residents. It was an ordeal for those impacted to prove the wells caused the problem. Once again, taxpayers covered costs however, these records have not been provided to the public. *Provide records of the interference impacts and mitigations that took place including costs. These are relevant to the proposal. *All records of interference, monitoring data, and enforcement pertaining to this development must be made publicly available and posted on the Public Registry. "There are no predicted impacts directly related to climate change because of the Project activities. The WTP is considered a Post Disaster Structure and will be designed and constructed based on those codes and standards. The WTP is a resilient structure engineered against extreme weather conditions."(p26, EAP) This scrap of info was placed upside down in the EAP. Although we appreciate the rugged resilience of the post disaster structure, RO plants actively waste water. This goes against understood climate change resiliency measures and principles of sustainable development. The plant actively produces a deleterious effluent (ROC) and requires energy to operate. *Detail operation and maintenance costs. Include energy usage, membrane and greensand longevity and replacement, disposal of membranes and greensand, concentrate disposal, retention pond, diversion maintenance, well fields, testing, personnel, etc. *What is the yearly volume of water wastage from the WTP?

Process waste is estimated to be ~9.4% of the total raw water volume and mainly comprised of RO concentrate and greensand backwash.

Population "Currently, as discussed in Section 1.1.5 the existing Water Rights License allows an annual allocation of 646.6 dam3 and an instantaneous pumping rate as 0.132 m3/sec (132 L/s). Although the instantaneous pumping rate is sufficient for the 2041 projections, the RM of Springfield will apply to increase the yearly allocation."(p15 EAP) *If the pumping rate is **sufficient for 2041 population projections, what is the reason for the RM's need to increase water draw? *Is additional draw required to** make up for water loss due to RO treatment? ***Is additional draw required for effective dilution of the concentrate for release to the environment to meet Tier standards, objectives, guidelines?**

The ultimate WTP capacity of 120 L/s requires an incoming raw water flow rate of 126 L/s. This equates to a required annual allocation of 1,649 dam^3 to make 1,566.6 dam^3 of treated water. The additional 5% is due to RO concentrate.

Human Health and Well Being "Overall, the potential effects on human health and well being will be positive and provide a long-term benefit to the RM of Springfield."(p26, EAP) The EAP fails to give any evidence to support this claim. RO treatment strips beneficial minerals out of the Water and it has been adequately demonstrated that consuming water of low mineral content has a negative effect on homeostasis mechanisms, compromising the mineral and water metabolism in the body . Rakhmanin et al(1989) 7 8 discovered "reduced skeletal ossification was also found in rat foetuses whose dams were given distilled water in a one-year study. Apparently the reduced mineral intake from water was not compensated by their diets, even if the animals were kept on standardized diet that was physiologically adequate in caloric value, nutrients and salt composition." According to Islam et al. (2016) , RO drinking water does not support human health, and may be particularly harmful 9 for children and low income

consumers who are already prone to malnutrition. Table 2-2 Predicted Water Quality of Treated Water contains NH3, F, Fe, Mn, Na, and TDS but no other information on what people and pets will be consuming. 7 8 Kozisek, 2004. Health Risk from Drinking Demineralized Water. P151. Rakhmanin YuA, Mikhailova RI, Filippova AV, et al. On some aspects of biological effects of distilled water. (In Russian.) Gig Sanit 1989; 3: 92-93. 9 Islam, M.R., Sarkar, M.K.I., Afrin, T., Rahman, S.S., Talukder, R.I., Howlader, B.K. and Khaleque A. 2016. A Study on Total Dissolved Solids and Hardness Level of Drinking Mineral Water in Bangladesh. American Journal of Applied Chemistry 4: 164-169. Draft18 ***Provide supportive information for the stated "positive" and "long**-term" bene**fi**ts of the treated water? *Provide a full analysis of what people and animals will be consuming? *Will treatment also include re-**mineralization of the** "**fi**nished water" as recommended by the WHO?

Only 20% of the raw water flow will be treated by RO. Treated RO water (permeate) will be blended back into the greensand filtration stream (filtrate) which will still contain its minerals (less iron and manganese). The high-quality treated water produced by the new WTP will not be harmful to humans.

If so, provide cost analysis. Field studies No field studies have been done on areas proposed for development; only desk top. It is plausible that small fish and other water species are present in the Diversion and other receiving bodies. Due to intensive drainage of wetlands, ditches have become "habitat" for many species. Orchids and other rare and endangered plants and animals can be seen in ditches. Of course, frogs and toads can be heard and seen in the area. So too, salamanders. Use of Manitoba's outdated volunteer based HERPS Atlas is clear indication that a proper field study is called for. *If rare or endangered species are encountered who will be **onsite to identify them and take appropriate measures? "Standard right of way seeding will** be used in the appropriate areas. This will limit wind and water erosion and help to establish protected plant species that may be present in the seed bank."(p27, EAP) *What does **standard ROW seeding consist of? Is it spread and left or tended to?**

The ROW is seeded in accordance with the Manitoba Water Services Board Standard Construction Specifications 02 48 50 Topsoil and Finish Grading

Conclusion OLS has many concerns about the license application. The proposed Project is unnecessary if the wells were located further east, aggregate mining was subject to licensing under The Environment Act, and protections currently available are enforced. The Proposal presents a best-case scenario, key components remain unproven and deficiencies in crucial information prevent a credible issuance of an Environment Act License. We are extremely concerned that the Department of Environment and Climate Change accepted the three wells in the license application without requirement of an environmental assessment. We consider this lack of assessment for a key component of and reason for the Reverse Osmosis treatment plant to be unreasonable and conflicts with best practice standards for environmental assessment. As a grass-roots organization we have limited funds and thus lack of access to experts. As Manitobans, we rely on our elected officials to act in our best interests and the Department of Environment and Climate Change to ensure their decision-making is based on accurate and timely information. However, when a proposal lacks significant data, information, a cumulative effects assessment, and the knowledge base of the aquifer system in southeast Manitoba remains perilously deficient and recommended reform of Manitoba's environmental legislation is ignored for decades, it is difficult to have trust in the process and be assured that our environment and thus our health is truly taken into account. Under The Environment Act,

	the Department of Environment and Climate Change is tasked with protecting the quality of the environment and environmental health of present and future generations and providing the opportunity for all citizens to exercise influence over the quality of their living environment. We trust the department will adhere to these principles and ensure that an evidence-based decision about the proposed development can be made. We cannot have healthy communities and a strong economy unless we are committed to evidence-based decision making, an accountable public service, and transparent public processes. The Manitoba government should postpone any licensing or finding respecting this application until a full and proper assessment of project impacts are available for consideration. As proposed, the project must not be licensed.
37)	The wells were drilled in January of this year. There is no acceptable excuse to allow the licensing of the three wells and then assess them at sometime in the future. The RO treatment plant requires the wells for supply. The wells must be assessed in this application to confirm the validity of the project and allow for an evidence-based licensing decision. What rationale was provided to ignore assessment of the wells in this application to license them? Further east would not require RO treatment and would be a less costly option for residents. This is not the time to financially burden residents especially when a less costly, more healthy option is feasible. Water quality analysis for Cooks Creek is provided in Table 2-3. Sampling of Cooks Creek occurred for one day July 7, 2022. Is this an accurate analysis of water quality in the Diversion where the concentrate will be released? Dugald raw water is high in fluoride and will be present in the concentrate above allowable levels. Why are no levels provided for Fluoride in the water quality analysis Table 2-3? Shouldn't **fl**uoride levels in the Diversion be **measured to ensure the Diversion is capable of diluting the concentrate? What impacts occur to Lake Winnipeg? Can it handle this additional 'pollutant'.** The Provincial Tier II Water Quality Objectives in receiving water guidelines are applicable to this project and fluoride is not included. Assessment of the cumulative effects is outside the scope of the proposal requirements. The Sept 2023 Springfield Water and Waste Monthly Report states "Following dialogue with and feedback from the Manitoba Water Services Board, the project[Dugald Raw Water Well Field Phase 2 Expansion] is being rolled into the Dugald Oakbank Water Supply Phase 3 Upgrades and Expansion Project as an additional $300K in MWSB funding was made available to the RM towards the overall project". How is a separate assessment of the well **fi**eld expansion supported when the projects have been rolled in together? Please explain why only two wells are listed in the General Borrowing Bylaw when provincial funding of $300K was allocated for the 3 well expansion? Has the full price tag of the project been presented to the public? Please detail maintenance costs of the plant and infrastructure? The Province must postpone any licensing or finding respecting this application until a full and proper assessment of project impacts, including cumulative effects, are available for consideration and that provisions for the Technical Advisory Committee and the public to comment are provided. A majority of municipal council members to implement a general borrowing bylaw to tax all residents for a new serviced water supply that they will receive no benefit for the balance. Discussion on funding/borrowing is not applicable to the EAP submission.
38)	Reach a cost sharing agreement with the RM of Tache to pipe treated water from the water treatment facility in Lorette to the Dugald treatment center. Estimated cost of pumps and

	water line is $5.7 million. The RM of Tache does not have the allocation or treatment capacity to support this claim. Firefighting reservoir capacity would still need to be constructed for Oakbank, along with additional treatment capacity in Tache.
39)	Draw untreated water from the Shoal Lake Aqueduct prior to entering the water treatment facility on Provincial Highway #207. Check with Provincial Archives and confirm what the previous agreements are with the City of Winnipeg as RM of Springfield gave up land and right-of-ways allowing the water rail line and aqueduct through RM of Springfield. The International Joint Commission (IJC) agreement would need to be renegotiated to allow for water to be utilized outside of the current City of Winnipeg boundaries.
40)	Draw water directly from the Greater Winnipeg Water Treatment Plant on Provincial Highway #207 and pipe approximately 5 k to the Dugald treatment and distribution center. (See attached G. Greater Wpg. Water Treatment Plant to Dugald) This is a great idea; however, the City of Winnipeg is not permitted to share potable water supply outside its border.
41)	The RM of Springfield is blessed with many options and opportunities to draw from another new pristine fresh water supply. An example is the RM of Springfield approved a major draw of aquifer water for Sky Blue Water Inc., a water bottling company close to Provincial Highway #302 and #15.
42)	Review SKY BLUE PERMITS AMD 24-hour water well capacity test. I am Assuming for simplicity we use the same well casing size and pumps drawing 200 U.S. gallons per minute as used by Friesen Drillers and confirm the 24 hour draw rate capacity is 288,000 U.S. gallons or 1,152,000 litres per day.
43)	Typically, a Springfield resident will consume 186 litres per day. So, the Blue Sky well would without any physical change in increase pump pressure or well casing size under current permits will support 6,200 Springfield residents and presently there are 1334 Springfield residence on piped water.
44)	This is the easiest example we could use to show the mayor and particularly the CAO FAILED in their responsibility to ensure good business practices were used to identify and consider all the options available to the Municipality. New 302 and 15 wells clearly meet the criteria for lower capital costs. A cleaner low solid sustainable water source that is environmentally friendly including low operating costs.
45)	**So why didn't this location receive an incredibly detailed consideration? WHY? Was it just** gross mismanagement of the public purse or was there a deal agreed to with the previous **conservative government? How did the Sio Silica application affect the RM's d**ecision. Was a **new source of water east of Anola ruled out because of the risk of contamination from the Sio Operation?** Or was this very favorable option a glaring example of insufficient due diligence on behalf of the administration and its mayor. Many of the statements here are factually incorrect. This project was not planned around nor has been affected by the previous Sio Silica project and associated applications.

46) Commission an independent engineering study to determine where in the municipality a sustainable pristine water supply can be developed. The new location must meet the RM's future needs and be a viable cost effective and environmentally friendly location with minimal treatment requirements. Enclosed is an example of high-level costing. Costs are estimated at $8,413,222.00. (See attached I. Cost drawing from Pr. Hwy 302 – Dugald Pr. Hwy 206)

The RM has previously undertaken this study, and this was the most cost-effective option.

APPENDIX A

TECHNICAL PRESENTATION AND PUBLIC CONSULTATION (ZOOM RECORDING)

APPENDIX B

DUGALD-OAKBANK WATER SYSTEM (DOWS) 3RD PUBLIC OPEN HOUSE & CONSULTATION SIGN IN SHEETS

APPENDIX C

ASSOCIATED ENGINEERING (SASK.) LTD.
PUBLIC OPEN HOUSE PRESENTATION

APPENDIX D

FRIESEN DRILLERS LTD.
PUBLIC OPEN HOUSE PRESENTATION

APPENDIX E

FRIESEN DRILLERS LTD. PROPOSED EXPANSION OF THE DUGALD MUNICIPAL WELL FIELD HYDROGEOLOGY INVESTIGATION RESULTS

APPENDIX F

ASSOCIATED ENGINEERING (SASK.) LTD.
SUPPLEMENTAL INFORMATION
TECHNICAL MEMORANDUM



Dugald Oakbank Water System

Public Open House

September 11, 2024

Water Treatment

Water Quality

- Guidelines for Canadian Drinking Water Quality (GCDWQ)
  - MAC = Maximum Acceptable Concentration
  - AO = Aesthetic Objective

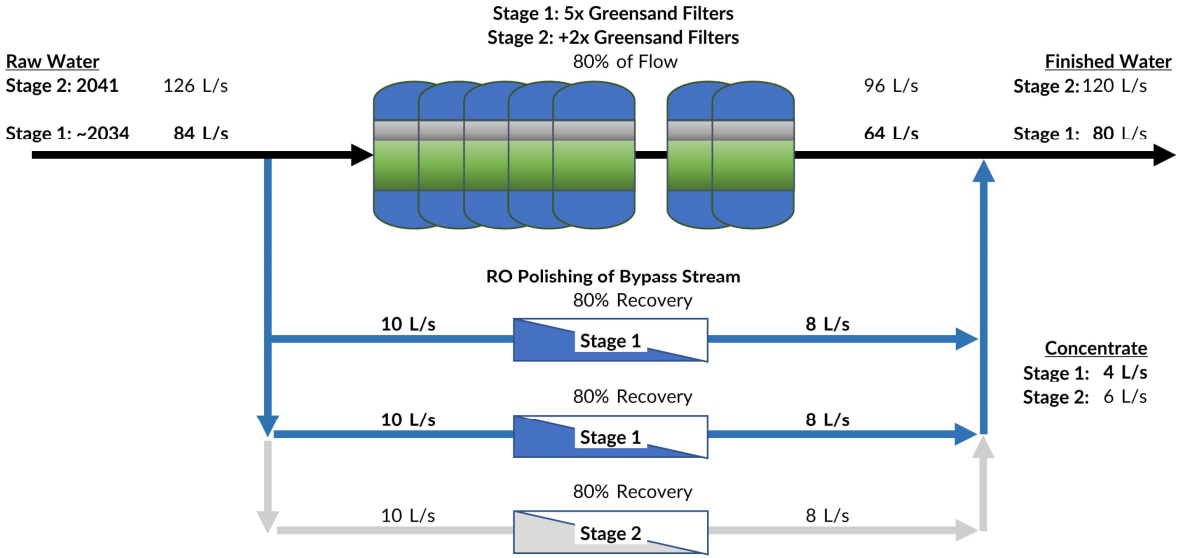
Targeted Water Treatment Parameters

Parameter	Units	Average Raw Level (2022)	GCDWQ Regulation
Fluoride (F)	mg/L	1.60	1.5 MAC
Iron (Fe)	mg/L	0.203	0.3 AO
Manganese (Mn)	mg/L	0.00547	0.12 MAC / <0.02 AO
pH		8.6	7 – 10.5
Sodium (Na)	mg/L	208	200 AO
Total Dissolved Solids	mg/L	591	500 AO

Treatment Selection

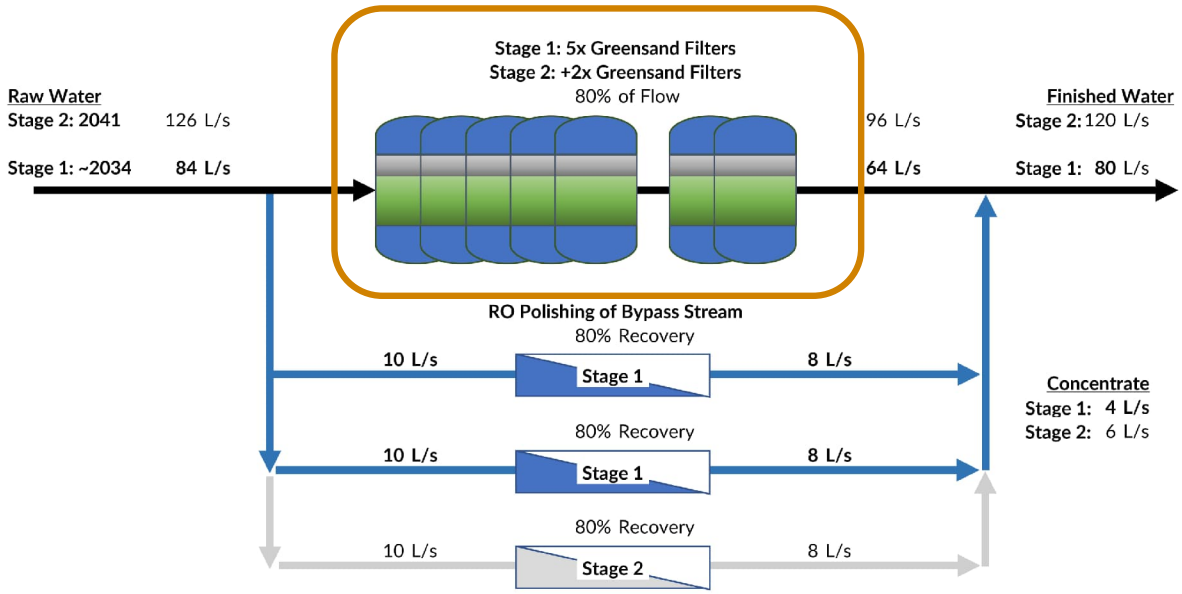
- Options explored, greensand and reverse osmosis (RO) selected
  - Robust, proven treatment technology

- 80% Raw Flow: Greensand Filtration
  - Targets iron and manganese
- 20% Raw Flow: Reverse Osmosis
  - ~98% removal of most parameters
  - ~70% removal of ammonia



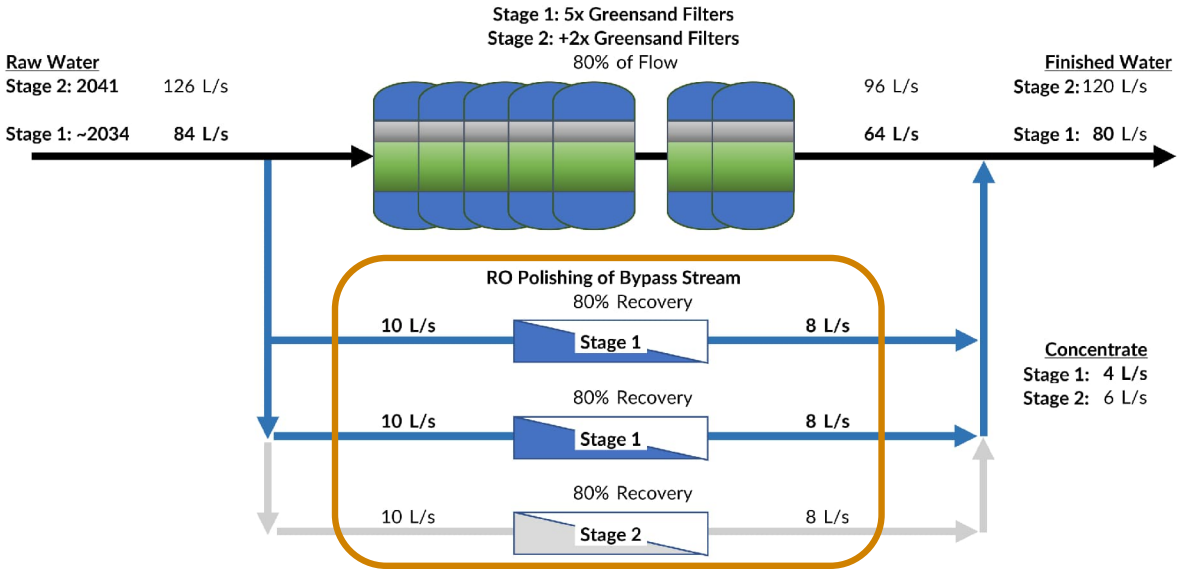
Greensand Filtration

- Treatment of 80% of the Raw Water Flow
  - Proven, robust treatment technology
  - Very common in Manitoba, including the Anola WTP
- Very effective for iron and manganese removal
- Can handle variability in the raw water concentrations



Reverse Osmosis

- Treatment of only 20% of the Raw Water Flow
- Recommended by Health Canada for fluoride removal
- More efficient than point-of-use residential systems
- 80% Recovery Rate (treated water/permeate)
  - 20% waste (concentrate for disposal)
- Greensand Filtrate + RO Permeate = High Quality Potable Water



Reverse Osmosis WTPs in Manitoba

- Southwest Regional Water Co-operative – Melita Water Treatment Plant
- Town of Rivers Water Treatment Plant
- Town of Neepawa Water Treatment Plant
- Town of Niverville Water Treatment Plant
- South Central Regional Water Co-operative – Pilot Mound Water Treatment Plant
- G3 Regional Water Co-operative Water Treatment Plant
- Baldur Water Treatment Plant
- Notre Dame Water Treatment Plant
- Cartwright Water Treatment Plant
- Municipality of Yellowhead – Shoal Lake Water Treatment Plant
- Kenton Water Treatment Plant
- Oak River Water Treatment Plant
- Erickson Water Treatment Plant
- Town of Killarney Water Treatment Plant
- Rural Municipality of Prairie View – Birtle Water Treatment Plant
- Pembina Valley Water Coop – Morris Water Treatment Plant
- Pembina Valley Water Coop – Stephenfield Water Treatment Plant
- Rural Municipality of Macdonald Water Treatment Plant
- Town of Virden Water Treatment Plant
- Town of Grand Rapids Water Treatment Plant
- Minitonas Water Treatment Plant
- City of Flin Flon Water Treatment Plant
- And many more…

Process Waste

Process Waste

- Raw Water Volume: 95% Potable Water Use, ~5% Process Waste
  - 1649 dam^3 Raw Water required to make 1566.6 dam^3 Potable Water
- Process Waste is mainly comprised of:
  - Greensand Backwash (potable water with elevated iron and manganese)
  - RO Concentrate (concentrated minerals)
- Process waste is stored onsite with seasonal discharge to Cooks Creek Diversion
  - Release annually from April 1st to November 15th

Process Waste Discharge

- Meet Provincial Tier II Water Quality Objectives in receiving water
- Receiving water:
  - Cooks Creek Diversion
  - Red River
  - Lake Winnipeg
- Discharge timing:
  - When there is sufficient flow in the diversion
  - No discharge during periods of low flow
  - At no flow, discharge based on Red River criteria

SPRINGFIELD

1873 - 2023

Proposed Expansion of the Dugald Municipal Well Field Rural Municipality of Springfield

Presentation of the Hydrogeology Investigation Results

September 11, 2024

RURAL MUNICIPALITY OF SPRINGFIELD

THE MANITOBA WATER SERVICES BOARD

Friesen DRILLERS

Who we are.

- Friesen Drillers Ltd. is a family owned & operated business.
- Specialized in hydrogeological exploration, water supply development, and aquifer resource management.
- Decades of project experience (est. 1892) that spans both the province and country.
- Team of licensed professional Hydrogeological Engineers and Geoscientists (P.Eng./P.Geo.)
- Registered with EGM and qualified to carry out municipal supply projects.

ENGINEERS GEOSCIENTISTS MANITOBA

Manitoba Regulatory Framework

Other Important Acts
Groundwater and Water Well Act
– Well Drilling Regulation
Manitoba Water Services Board Act
Engineering & Geoscientific Professions Act

Water Rights Act (1988)

- Both groundwater and surface are property of the Crown under the Water Rights Act.
- Water use must be authorized by a Water Rights Licence from Manitoba Environment & Climate Change.
- The Water Rights Act is not subject to a public review process. The departmental hydrogeology staff review the applications and issue licenses under the authority provided to them under the Act.

Environment Act (1987)

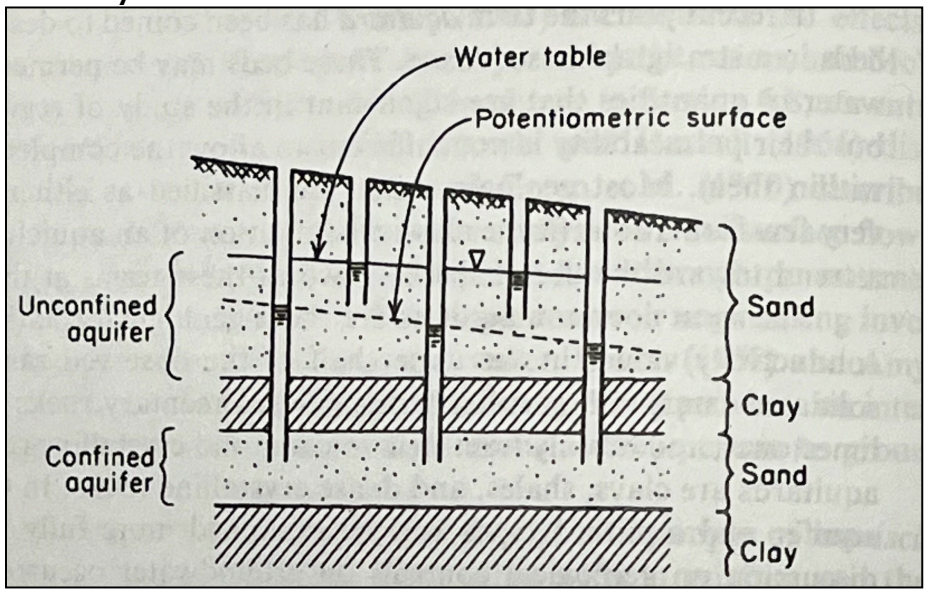
- A Class 2 Environment Act License is required for groundwater supplies which exceed 200 dam3/year.
- The proposed expansion of the Dugald well field (1,600 dam3) would require a new EAL.

Drinking Water Safety Act (2002)

- Response to the Walkerton Water Crisis in Ontario.
- Outlines steps to ensure that public water is safe to drink. Provides direction on disinfection, water quality testing, record keeping and public reporting requirements.
- Distinguishes groundwater, surface water, and Groundwater Under Direct Influence of surface

Confined vs Unconfined

- *Unconfined aquifer*: formation exposed directly to the surface.
- *Confined aquifer*: formation bounded between layers of low permeability material.



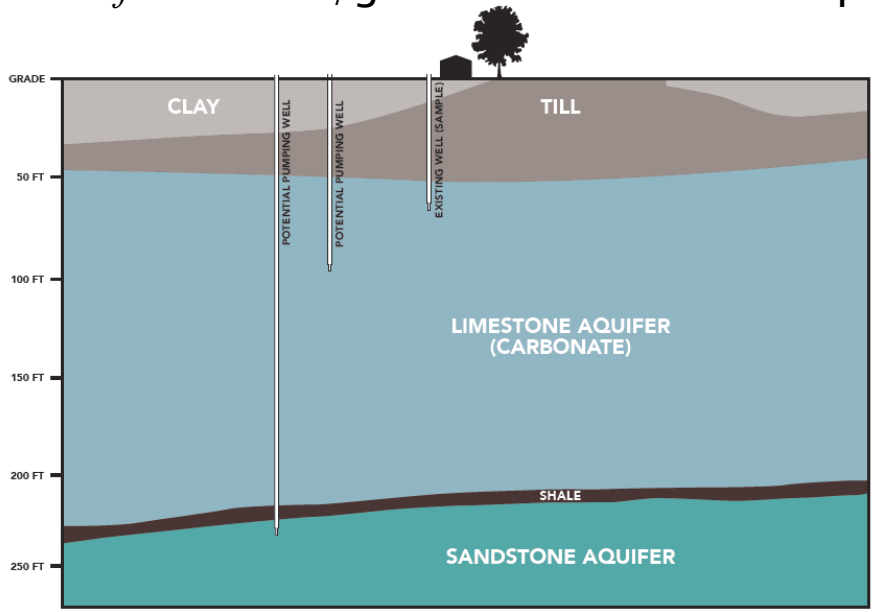
GUDI – Groundwater Under Direct Influence

Defined as: conditions where microbial pathogens can travel from surface water, through the aquifer and into a water supply well.

Groundwater supplies determined to be GUDI inherit an increased potential for adverse water quality and increased variability.

Examples in Springfield

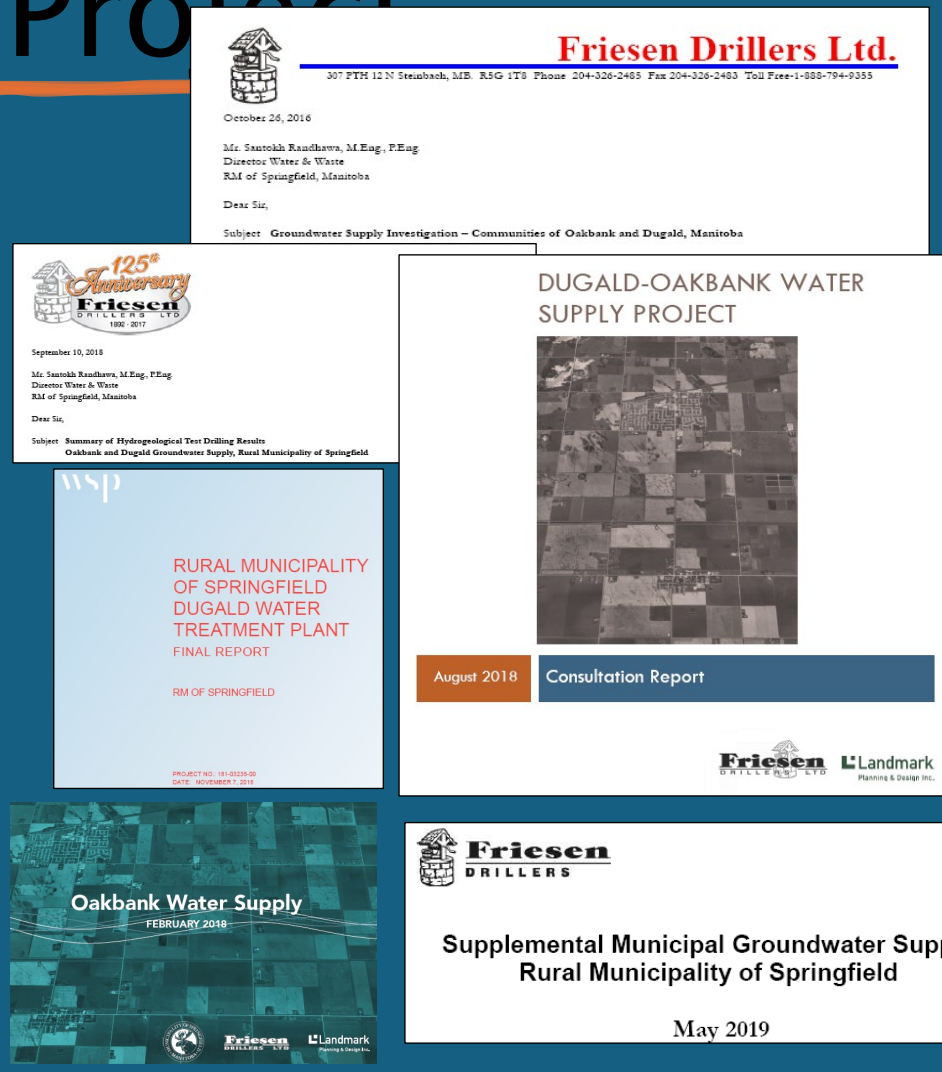
Unconfined: sand/gravel in Birds Hill Complex



Confined: carbonate and sandstone bedrock

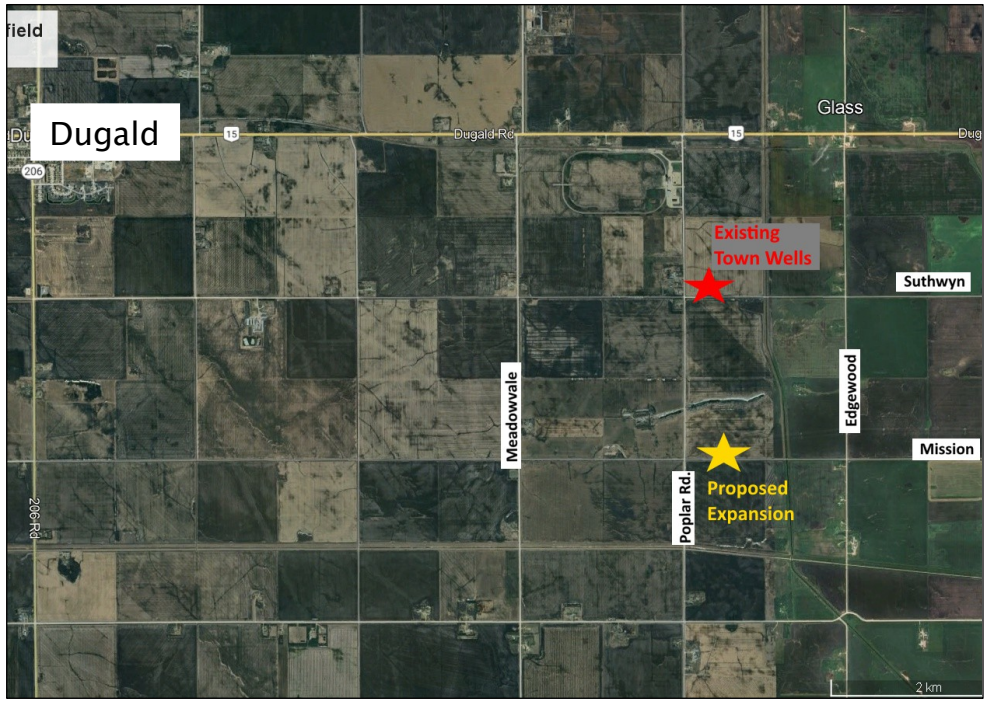
Timeline of the Dugald-Oakbank Water Supply Project

- *2016* – Friesen Drillers independently commissioned for a preliminary desktop hydrogeology study.
  - Review groundwater availability throughout the RM.
  - Describe advantage/disadvantages of different areas and aquifers.
- *2017 to 2019* – Field Investigations & Public Consultations
  - Comprehensive public consultations by Landmark Planning & Design.
  - Test program including 9 multi-level test wells across 12 square miles.
  - Extensive geochemistry sampling to determine conditions.
  - Feasibility of results evaluated by WSP and RM staff.
- *2020* – Water Rights & Environment Act Licences granted.
- *2021* – RM begins operation of Dugald well field (Well 1 & Well 2).
- *2023* – RM initiates project to expand the Dugald well field



Dugald Well Field Location

- The new supply wells (#3 & #4) are located one mile south of existing RM supply wells (#1 & #2) and are completed into the confined Sandstone Aquifer.
- The site selection was established through a multi-year process involving hydrogeological research and test work (test drilling, pumping tests, geochemistry sampling), technical analysis and review, and public consultations.
- Well 1&2 locations were selected by WSP and the RM as the most feasible option based on treatment and pipeline considerations.



Benefits of the Sandstone Aquifer as a water supply for the RM of Springfield :

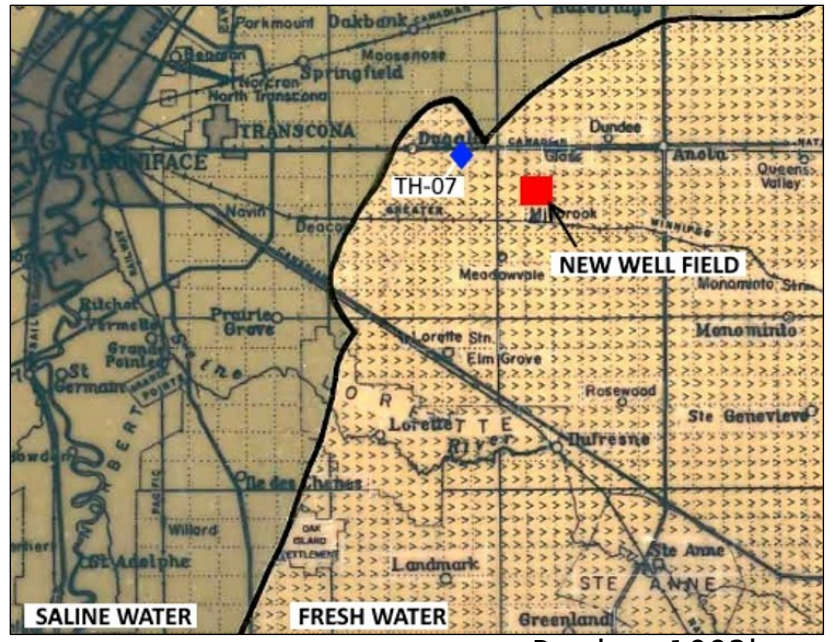
- Geographically extensive – very large regional flow system with significant storage capacity.
- Receives freshwater recharge on a regular basis.
- Naturally confined aquifer – high level of protection from surface impacts.
- Fresh and non-GUDI groundwater quality.
- Predictable hydraulic conditions and capacities – typically requires less fieldwork to prove out.
- Significant expansion potential to meet future demands.

Saline-fresh water boundary

A water quality boundary is present in the Sandstone Aquifer, with brackish water to the north/west and fresh water in the southeast.

The boundary has been mapped by the province with varying results. The following comments can be made from the maps:

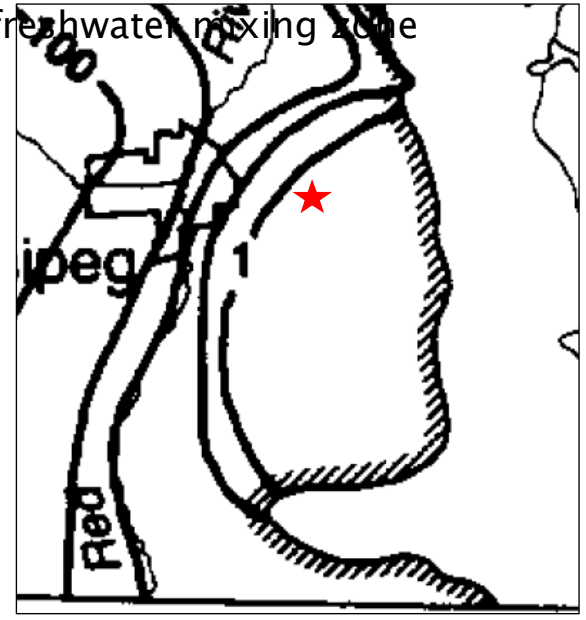
- The maps are at a regional scale and should not be used for site-specific decisions.
- In practice, no sharp boundary exists in the aquifer. Instead, there is a transition zone between fresh and brackish groundwater.
- The maps define brackish as TDS content >1,000 mg/L; commonly defined as >2,000 mg/L. The boundary as mapped is considered to conservatively represent the southeastern front of a brackish-freshwater mixing zone



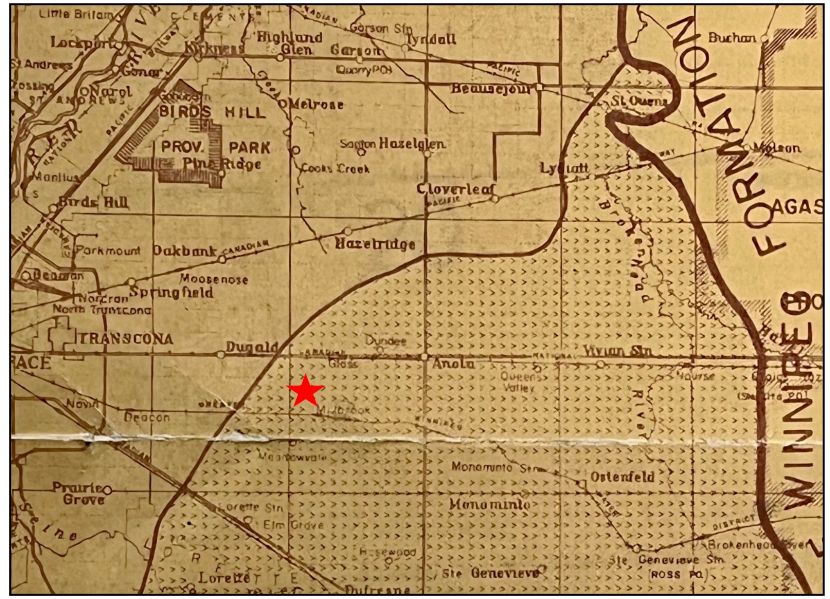
Betcher, 1992b

Considerations for the Dugald Well Field

- The shortest distance from provincial map boundaries to the expanded RM wellsite is approximately 3 miles.
- Using local geochemistry data, the saline-freshwater boundary (1,000 mg/L TDS) is 4-5 miles to the north and more than 10 miles west.
- The boundary is outside the radius of influence for the RM wellfield. Expansion would be progressively farther away from the boundary.
- A groundwater monitoring plan is in place to monitor for changes.



Betcher et al., 1995



Betcher, 1992a

Test Well Construction

- Two new wells constructed were long north side of Mission Road in Feb 2024.
- Similar completion to previous RM wells #1&2, with screen installed into the sandstone aquifer.

Monitoring Well Construction Details
Water Supply Expansion - RM of Springfield, Manitoba

Well ID	Tag#	UTM X	UTM Y	Well Casing	Well Screen	Completion
Well 3 (west)	10184	661760	5525050	12-inch steel (0-252 ft. b.g.)	12-inch; 15-slot (252-312 ft. b.g.)	Sandstone
Well 4 (east)	10185	662141	5525060	12-inch steel (0-255 ft. b.g.)	12-inch; 15-slot (255-315 ft. b.g.)	Sandstone

Owner Name: RM of Springfield (First / Last)
Mailing Address: 100 Springfield Centre Drive. Box 219
Town/City: Oakbank
Postal Code: R0E 1J0 Phone:
Email:

Well Location: (see note 3; attach sketch if necessary)
Civic Address: Poplar Road & Mission road (if different than mailing address)
Quarter: SW Section: 29 Township: 10 Range: 6 ☒E ☐W
Parish: Type & Lot No.:

Well Name: (if applicable) Well 4 - East Well
Well Identification Tag Number: 10185
Location of Tag ☒ Attached to casing stick-up
☐ Other (specify)

GPS: (see note 4), Accuracy +/- 11 ☒ feet ☐ metres
Latitude (decimal degrees) 49.85600
Longitude (decimal degrees) 96.74421
Rockwood Sensitive Area: ☐ Yes - Permit No. ☒ No

Test Hole (see note 5) - Sealed ☐ Yes ☐ No or
Well Use: ☐ test well - Sealed ☐ Yes ☐ No
☒ production/source ☐ recharge/return
☐ monitoring ☐ dewatering ☐ geotechnical
☐ other (specify)

Method of Construction:
☐ auger ☐ bored ☐ backhoe/dug
☐ rotary (mud) ☒ rotary (air)
☒ dual rotary ☐ driven ☐ jetted
☐ other (specify)

Water Use: (Check all that apply)
☐ domestic ☒ public/semi-public ☐ irrigation
☐ commercial/industrial ☐ livestock/poultry
☐ earth energy (heating/cooling)
☐ other (specify)

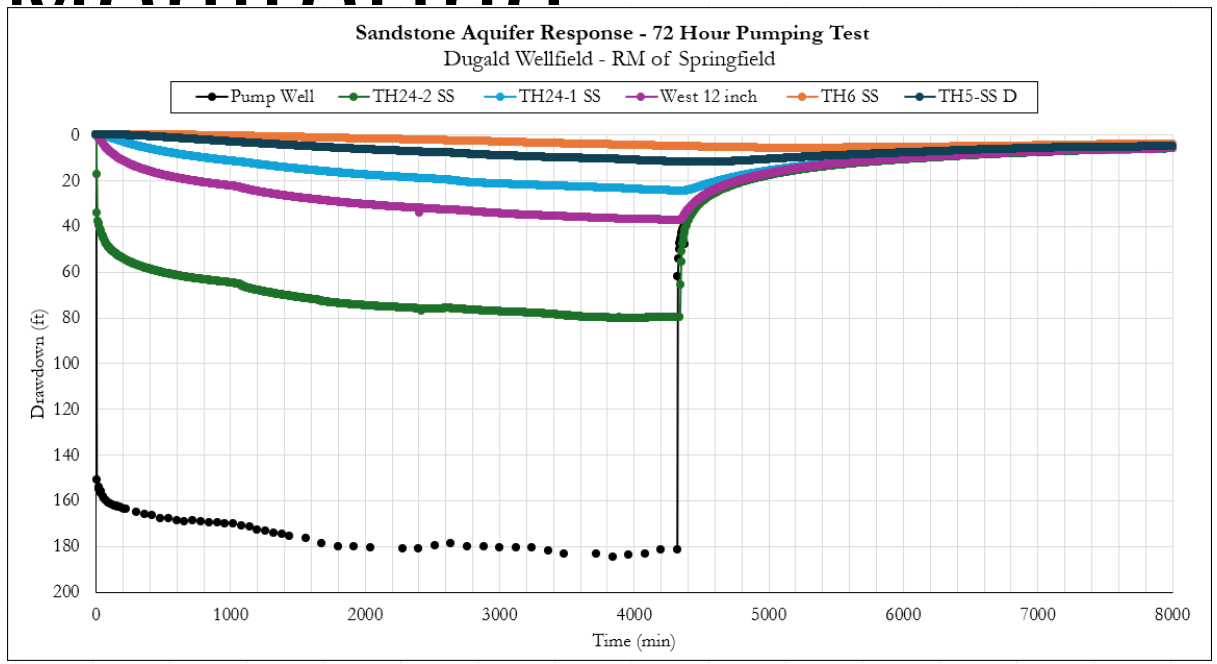
Lithologic Description: (see notes 6 and 7) - Measure From/To depths from ground surface. Attach another sheet if needed.

From (ft)	To (ft)	Colour	Material Description (use recommended names on guide)	Observations
0	26	Grey	Clay	
26	60	Brown	Till	
60	90	Brown	Gravely Till	
90	105	Brown	Limestone	
105	109	Brown	Fracked Limestone	
109	239	Brown	Limestone	
239	252	Red & Green	Shale	
252	317	White	Sandstone	
317	321	White & Green	Sandstone With Layers of Shale	
321	326	Green	Shale	

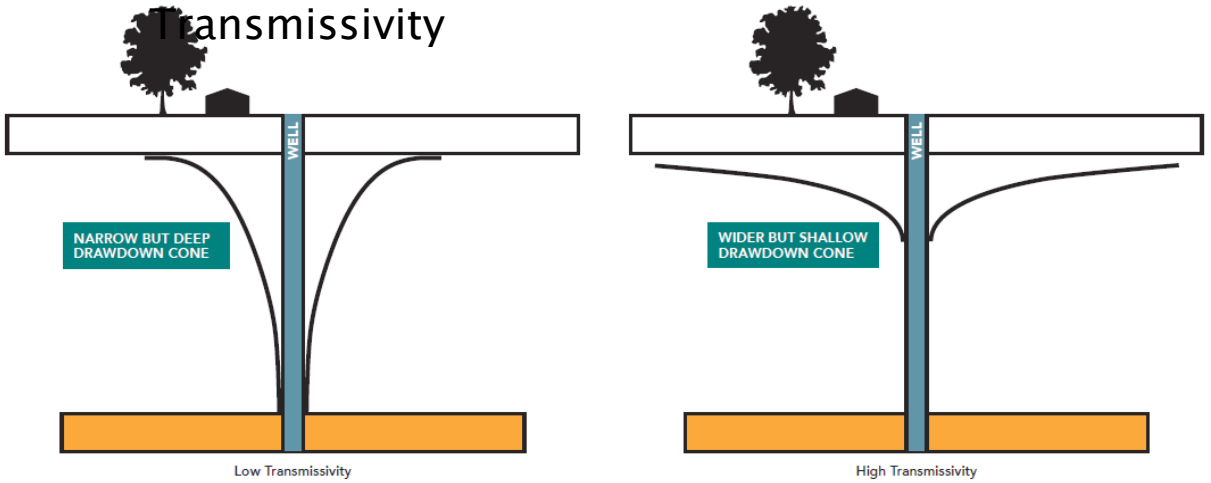
Well Construction: (see note 8) - Measure From/To depths from ground surface. Attach another sheet if needed.

From (ft)	To (ft)	Borehole	Casing	Liner	Open Hole	Well Screen	Surface Seal	Annular Fill	Filter Pack	ID (inches)	OD (inches)	Type of Material (ex: casing and screen material, screen type and slot size, use of shale traps , packers, screen blanks or tail pipes, and type and size of surface seal/annular fill/filter pack material)	Method of Placement (ex: poured, tremie)
0	117	X								16			
117	326	X								14¾			
0	255		X							12	12¾	Welded Black Steel	
255	315					X				12	12¾	Stainless Steel Wirewound - 15 Slot	
240	326								X			Silica Sand - .55	Poured
0	240						X					Envirogrout & Layers of Gravel	Poured

72-hour (3-day) Pumping Test & Groundwater Monitoring

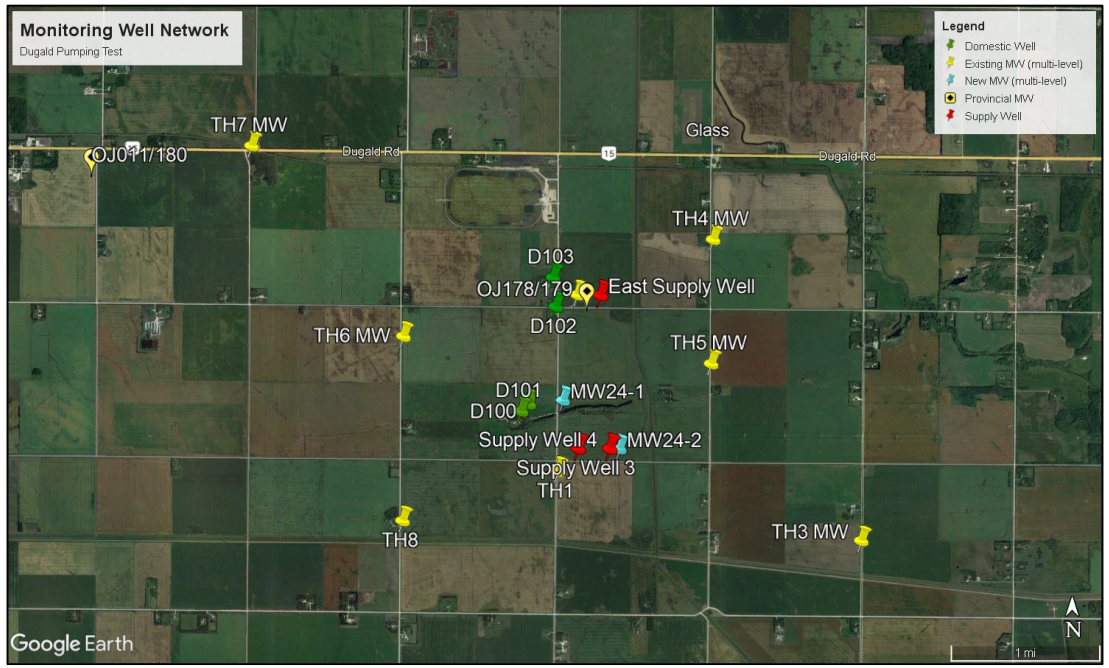


Influence of Aquifer Transmissivity



Large (30+) monitoring well network:

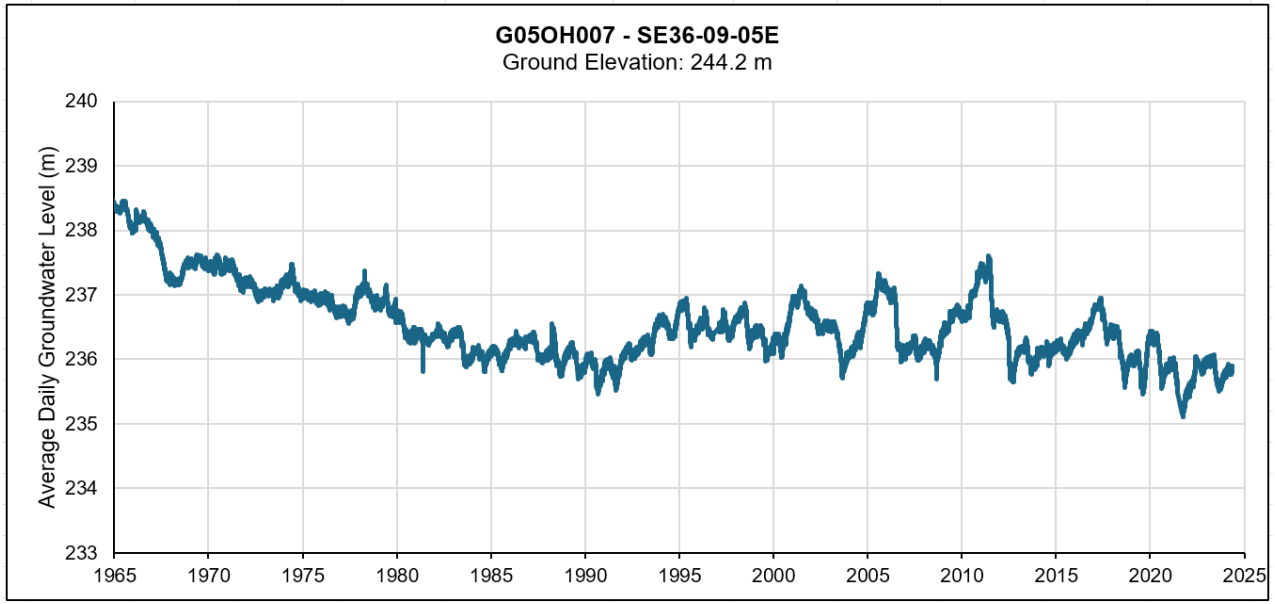
- 10 multi-level wells
- 6 provincial wells

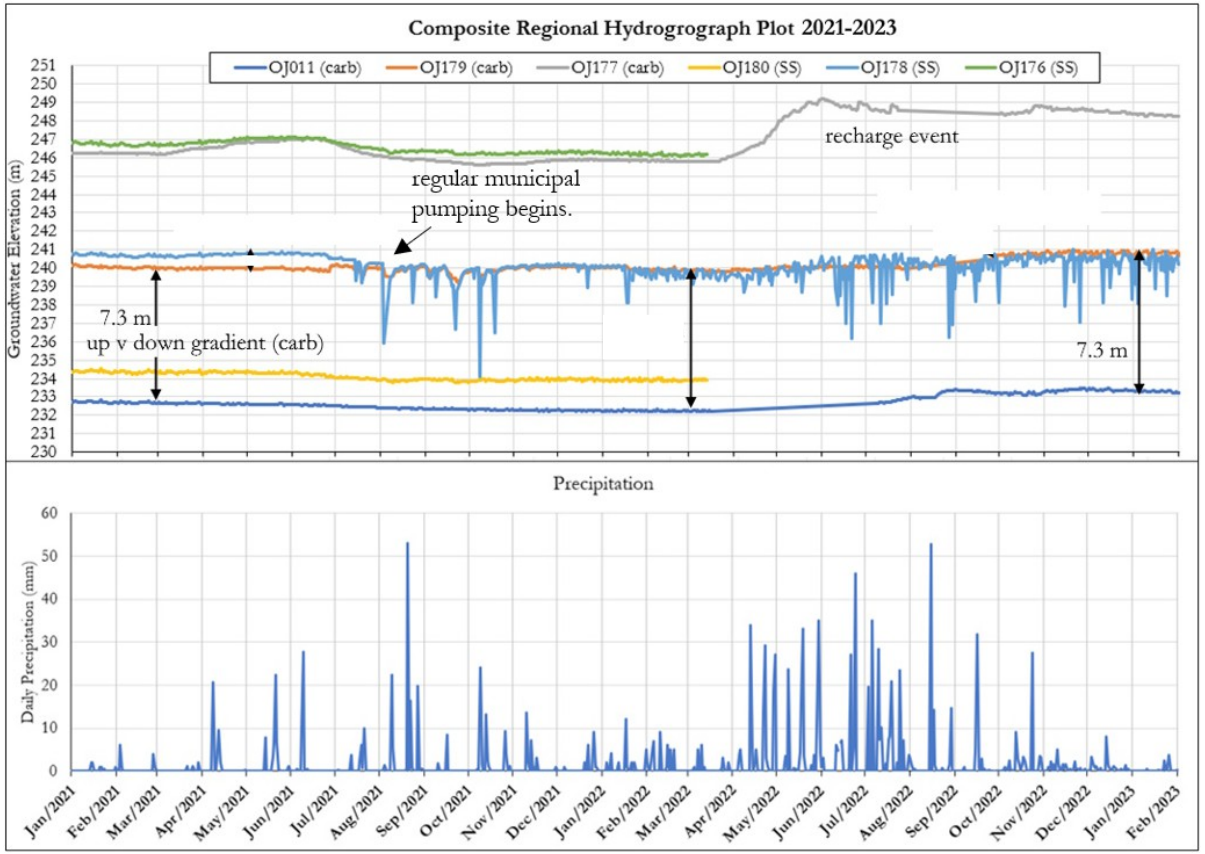


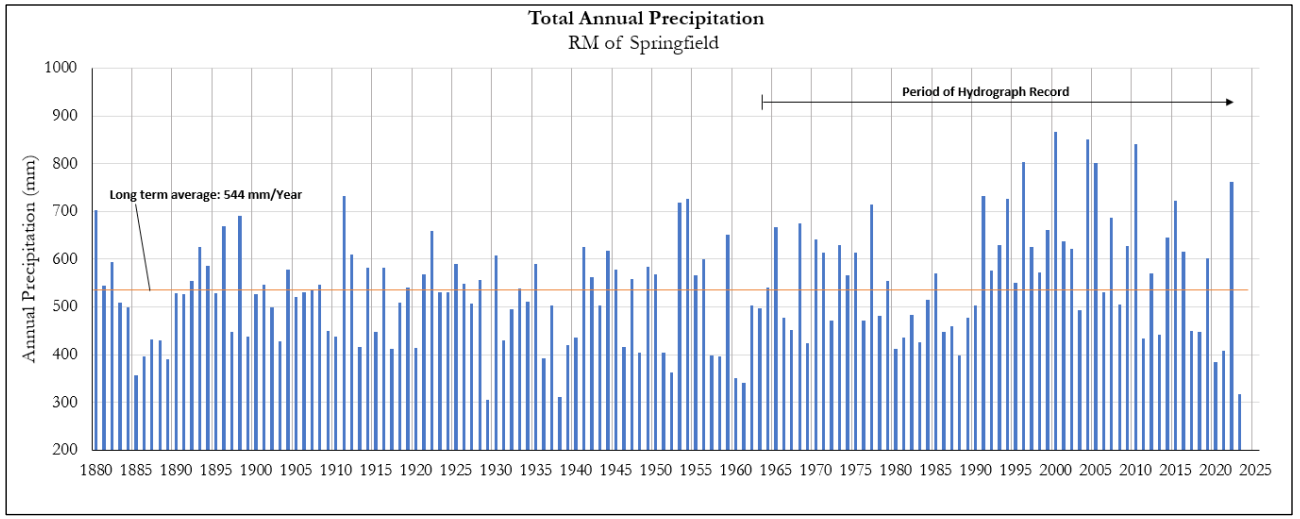
Geochemistry samples were collected every 12 hours throughout 3-day test:

- Results indicated stable parameter values (TDS ~650 mg/L).
- Consistent with previous work in the area.

Hydrographs & Background Aquifer Fluctuations







Conclusions & Recommendations

- The sandstone aquifer performed as expected during recent testing. The inferred transmissivity was 7,000 U.S.G.P.D/ft. Drawdown effects from pumping will extend offsite; however, the impacts decrease significantly with distance from pumping well.
- Drawdown impacts were significantly muted in the carbonate aquifer. Many carbonate observation wells measured zero impacts. Overall, drawdown in the carbonate was projected to be within seasonal and climatic fluctuations observed on regional hydrographs. Many older domestic wells are completed through both aquifers; this is no longer permitted under current regulation.
- Groundwater geochemistry was fresh (TDS ~650 mg/L) and consistent with the existing supply wells. The new municipal wells are considered to be a non-GUDI groundwater source. Treatment is planned to ensure safety and consistency in the distributed supply.
- Groundwater levels were reported within 10 ft. of grade, which results in approximately 80 ft. or more of available drawdown for existing groundwater users in the area. To accommodate groundwater level fluctuations (from both seasonal/climatic and pumping influences) all water wells should have modern connections, including the use of submersible electric pumps installed near the bottom of the well casing.

If the municipal expansion project is to proceed, the following recommendations were provided:

- A staged approach to the annual allocation was recommended to allow the aquifers to respond gradually to increased pumping.
- The new RM wells are suitable to be mechanized for use. The recommended maximum pumping rate for each well was as follows: Stage 1: 385 U.S.G.P.M. (24.3 L/s); Stage 2 development: 550-510 U.S.G.P.M.
- The Groundwater Monitoring Program should be updated to reflect the expansion. The program should include a review of transducer data and regional hydrograph data. The results of the groundwater monitoring program should be publicly reported.
- The Well Interference Plan should be updated. The RM, as the proponent of the project, will be required to resolve well interference complaints to the satisfaction of the Minister. Well interference effects should be reviewed regularly as part of the

Thank you!

RURAL MUNICIPALITY OF SPRINGFIELD

THE MANITOBA WATER SERVICES BOARD