

# Municipality of Glenboro – South Cypress

## Lagoon Expansion

# How It Started

- The Provincial Government (Manitoba Conservation and Climate) issued a letter to the Municipality dated May 27, 2015
- They required that the wastewater treatment system be upgraded stating that:

*"The lagoon does not meet current environmental standards, in particular with respect to containment in the secondary cell"*

# Existing Location of the Glenboro Lagoon



# Glenboro's Facultative Lagoon



Primary Cell

Exfiltration  
Cell



# Lagoon Statistics

- 0.4% Population Growth
- 20 year wastewater production  
291.6m<sup>3</sup>/day
- 230 day storage requirement



# Organic Capacity

- Current Organic Capacity: 76.2 kg BOD<sub>5</sub>/day
- 20 Year Projection Rate: 56.2 kg BOD<sub>5</sub>/day

**Sufficient**



# Storage Capacity

- Storage Capacity Required: 230 days  
between November 1 and June 15  
(top half of primary cell & storage cell volume)
- Primary Cells Storage Capacity: 22,492m<sup>3</sup>  
Exfiltration cell is not considered  
20 Year Storage Capacity Needed: 67,059m<sup>3</sup>

**Not Sufficient**



# Organic and Storage Capacity Summary

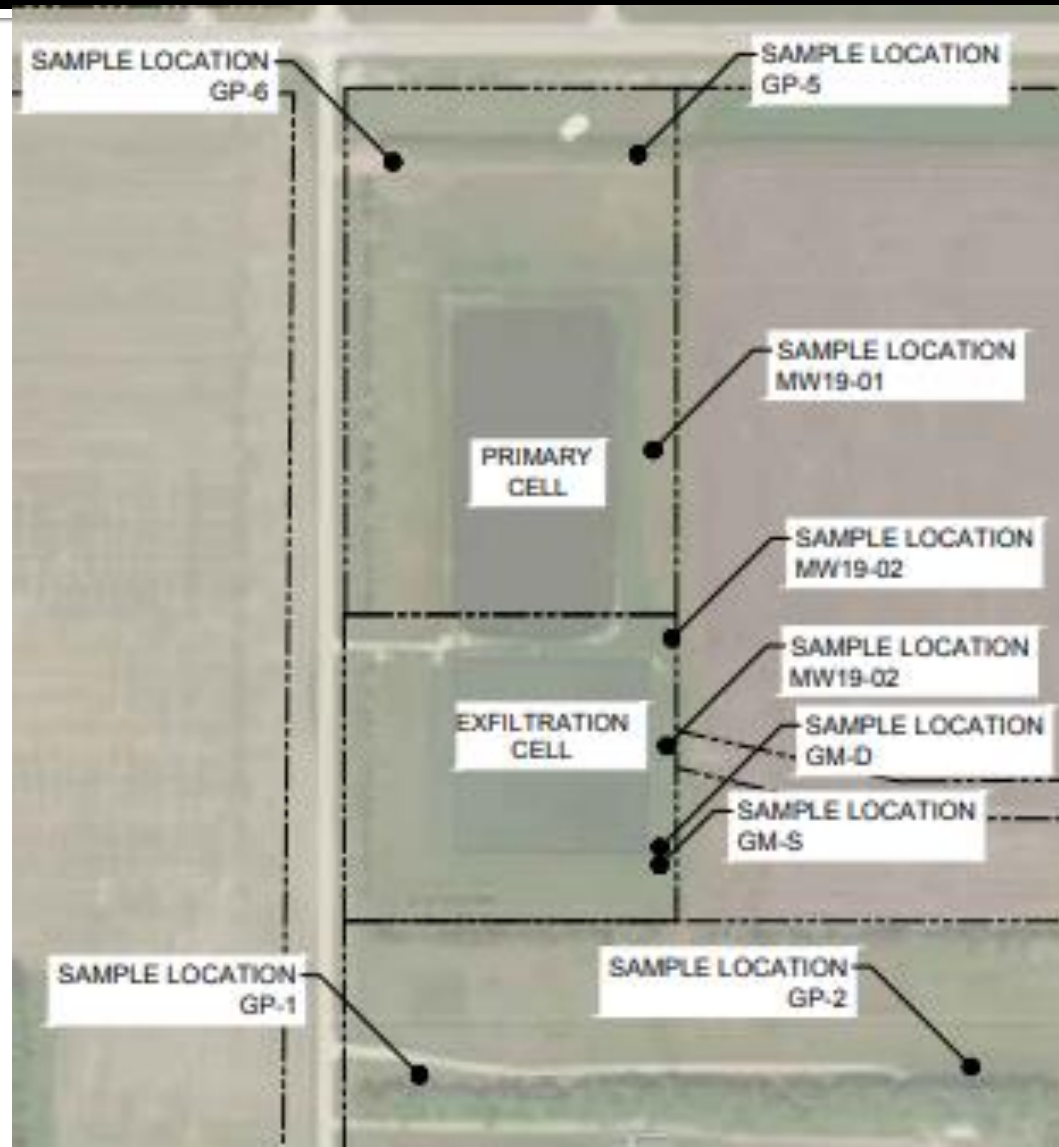
What does this mean?

It means that partly treated effluent is entering the ground through the exfiltration cell into the Assiniboine Delta Aquifer – the drinking water



# Groundwater Sampling Locations

- Groundwater flow direction is to the north towards the Assiniboine River.
- The River flows to the east and Glenboro is east of the lagoon
- Wells are placed between the lagoon and residential properties



# Highest Exceedance Total Coliforms - MPN/100 mL

- The exfiltration cell
  - Wells adjacent the lagoon
- Highest
- Lowest
- Wells on site but further from the lagoon

One off site coliform found at the Fair Grounds - thought to have been from animals at the grounds

>2420

488

411

3

2

1

1

0

1

# Other Health Based Groundwater Exceedances

- Arsenic and Manganese
  - Greater in groundwater than the exfiltration cell
  - Naturally occurring
  
- Fecal Coliform (MPN/100 mL)
  - Exfiltration cell: 9
  - One well adjacent the lagoon: 1
  - All others: 0

# Groundwater

- No off site groundwater exceedances of health based criteria; however, Conservation and Climate does not want exfiltration to continue in order to protect the groundwater from potential impacts
- Updated Lagoon will discharge treated water off site

# Proposed Lagoon Options

## JR COUSIN CONSULTANTS LTD.

### Proposed Upgrade Options:

1. Aerate & Line Primary Lagoon, add 2 Submerged Attached Growth Reactor (SAGR) cells, Discharge: Assiniboine River.
  - Capital Cost: **\$8,844,900**
  - 20 year lifecycle cost: \$11,061,200
2. New Lagoon in RM of Argyle
  - Capital Cost: **\$9,101,300**
  - 20 y Lifecycle Cost: \$10,114,300
3. Expand & use Spruce Woods Provincial Park Lagoon
  - Capital Cost: **\$8,833,700**
  - 20 year Lifecycle Cost: \$10,181,000

# Lagoon Options Continued

## SAMSON ENGINEERING INC.

- Use existing Primary Cell & bentonite modified clay liner
- Aerate primary cell with 2 partial mix cells & a settling cell
- Construct 2 SAGR cells north of existing primary cell
- Install pre-fabricated building for blowers
- Decommission existing infiltration cell
- Discharge: Assiniboine River
- Sewer upgrade component (\$1,314,532 of Capital Cost)
- Capital Cost: **\$5,519,099**
- Est. 20 Year Lifecycle Cost: \$6.623,000

# Lagoon Options

- With Samson's lagoon option, the average estimated cost savings, compared to JR Cousin options, would be approximately:
  - \$3,408,000 for capital costs
  - \$3,829,000 for the 20 year lifecycle costs

The Municipality has decided to proceed with Samson's option.



# Funding

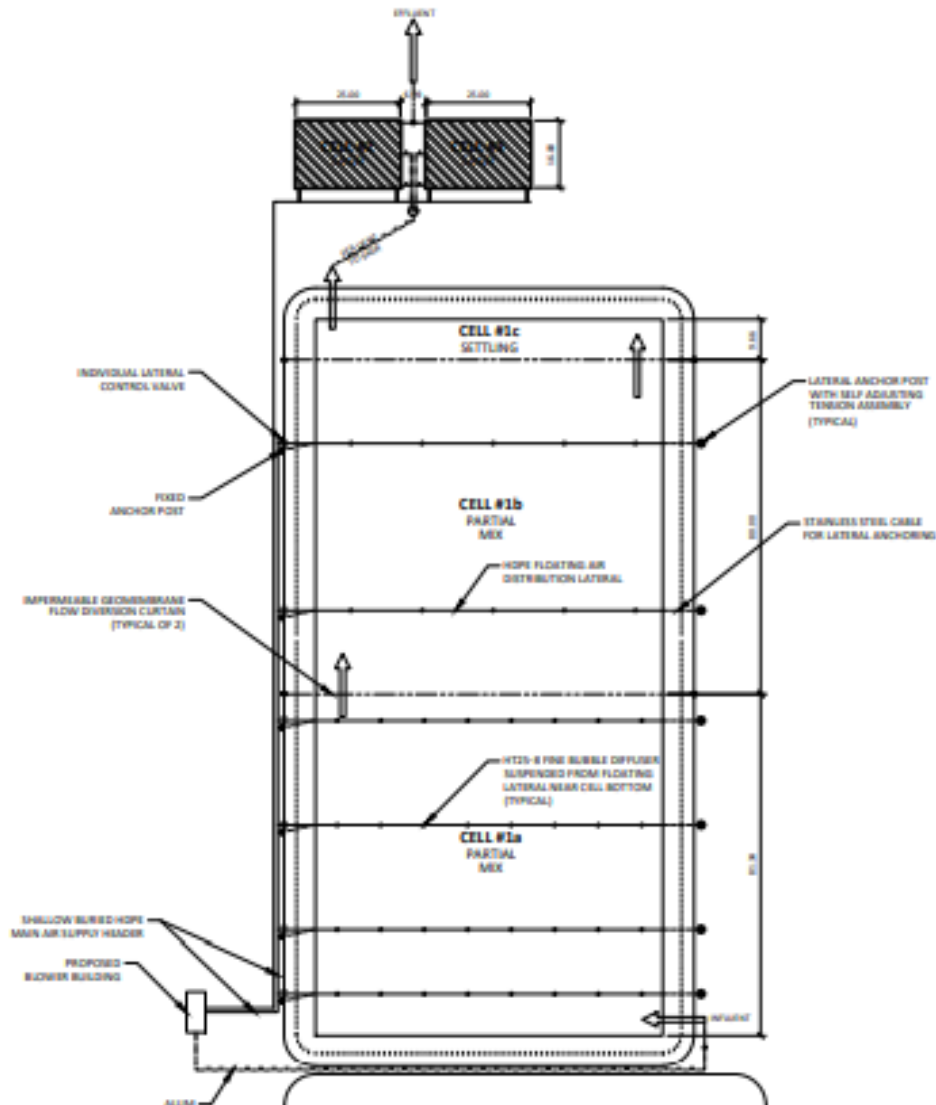
## APPLIED TO:

- Investing in Canada Infrastructure Program (ICIP)
- Green Infrastructure Stream – Environmental Quality
  - Estimated ICIP Contribution:  
**\$4,047,155.30**

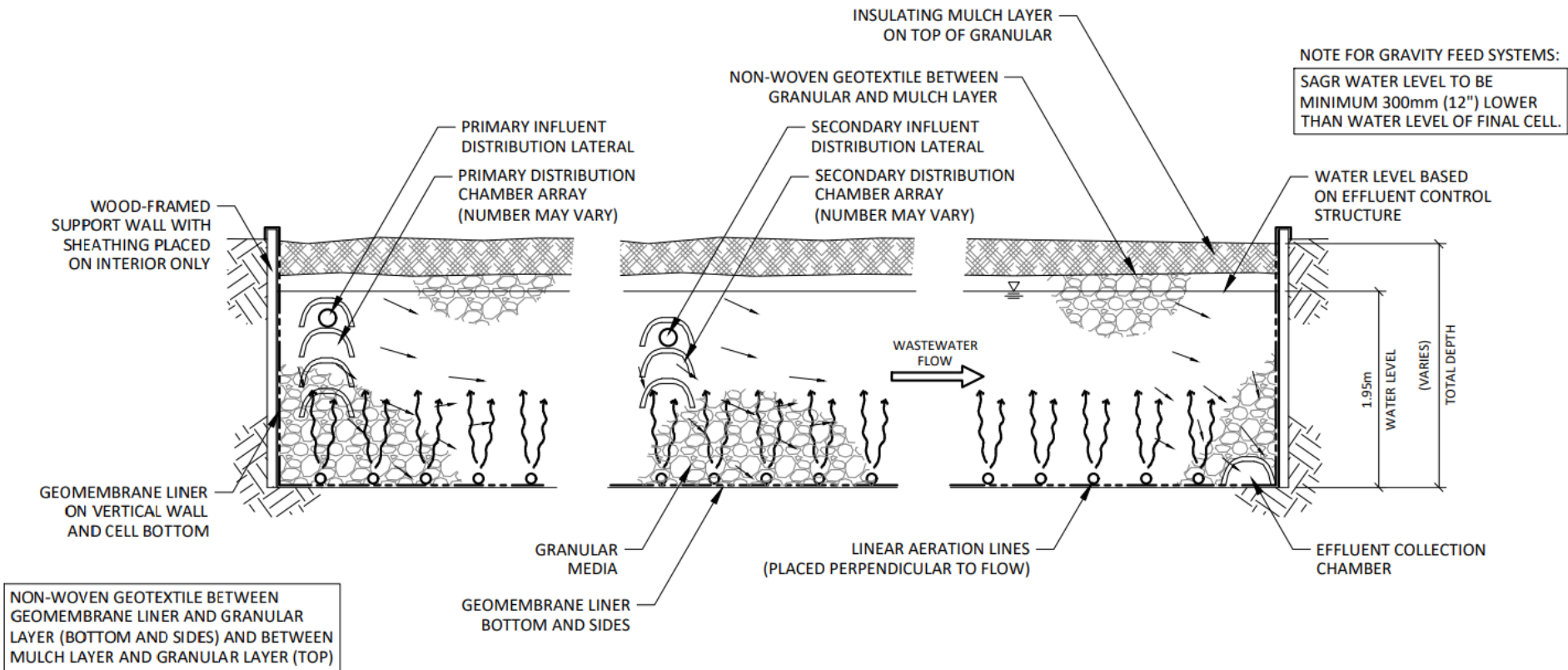
## ALTERNATIVE FUNDING:

- The Manitoba Water Services Board
  - 50/50 Split

# Typical Layout



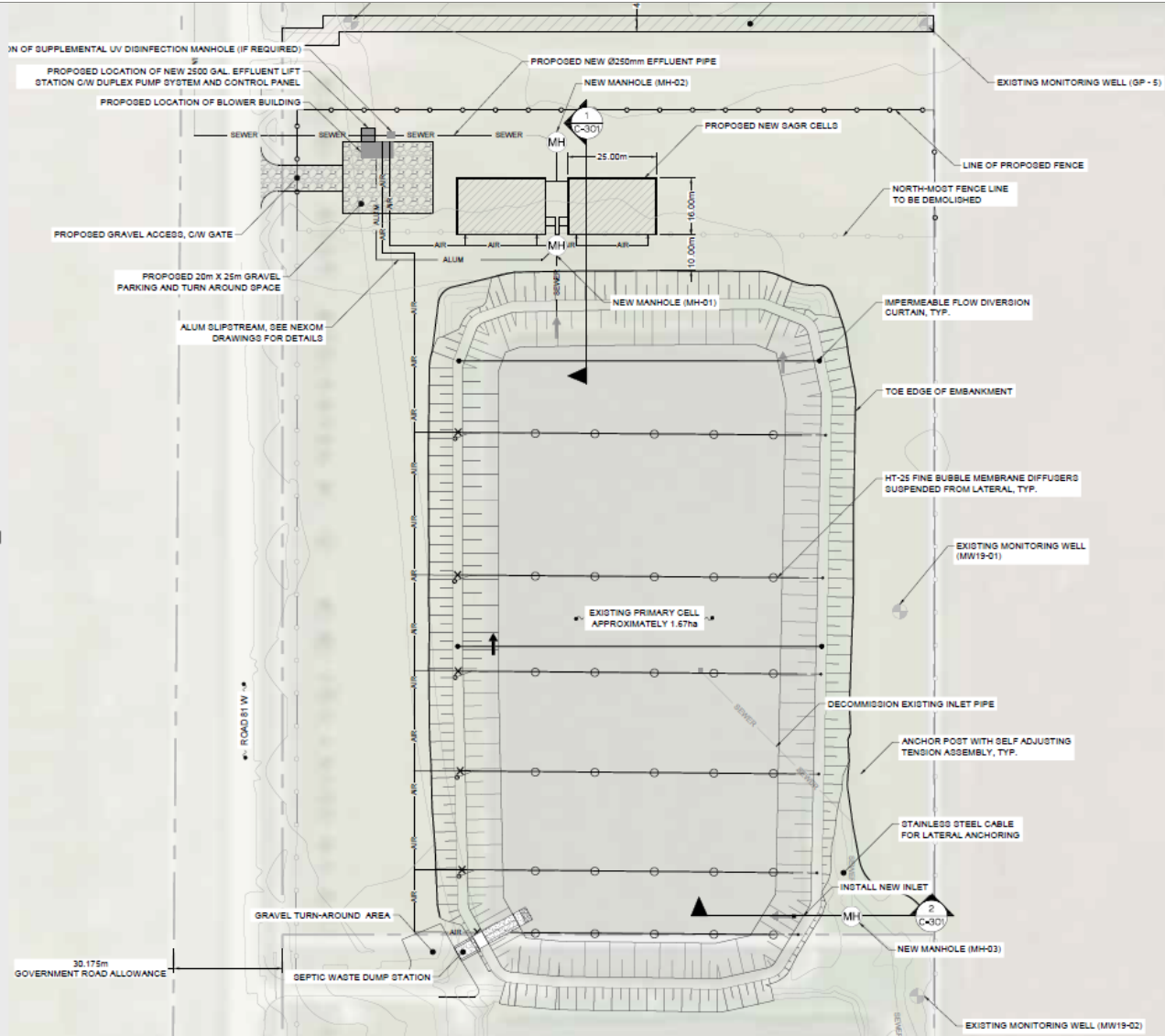
# SAGR HORIZONTAL FLOW



**HORIZONTAL FLOW SAGR - SECTION**

SCALE: N.T.S.

# Proposed Site Plan



# Proposed Discharge





# Example of SAGR Cell Construction





# Example of SAGR Cell Construction





# Example of SAGR Cell Construction





# Example of SAGR Cell Construction





# Example of SAGR Cell Construction





# Example of SAGR Cell Construction



# Glenboro Lagoon Summary

- Current facultative Lagoon exfiltrates partly treated water into the groundwater; however, there are no impacts leaving the lagoon site
- The Lagoon will be upgraded to an aerated primary cell with 2 SAGR cells that will treat water to meet surface water discharge limits
- Treated water will be discharged to the Assiniboine River
- Project is on hold until funding is received