



**SAGR**

NOW  
**35-65%**  
SMALLER!

**POST-LAGOON COLD-WATER NITRIFICATION**

**Effluent Quality at <1°C**

<b>Total Ammonia-Nitrogen (TAN)</b>	<1 mg/L
<b>cBOD<sub>5</sub></b>	<5 mg/L
<b>Total Suspended Solids (TSS)</b>	<10 mg/L

**Advantages**

**Fully nitrifies** in wastewater <0.5°C / <34°F

**Low operations and maintenance (O&M)** comparable to that of an aerated lagoon

**Disinfects E. coli** to <125 MPN/100 mL

**Applications**

**Municipal or industrial** post-lagoon TAN and BOD polishing

**Deicing fluid**-contaminated runoff treatment at airports

**Problem**

Lagoons built for BOD and TSS removal have a hard time meeting today's ammonia limits, especially in climates where water can drop below 5°C. With increasingly strict wastewater discharge regulations targeting effluent ammonia in recent years, many municipal and industrial facilities fear they may have to abandon valuable infrastructure.

**The Nexom Answer**

SAGR post-lagoon cold-water nitrification has demonstrated at 120+ sites that it reduces Total Ammonia-Nitrogen (TAN) to <1 mg/L, even in water <0.5°C. Here's why:

- **Rock media provides ample surface area** for nitrifying bacteria to grow on, and protects against temperature shock
- **Patented Step-Feed process** grows multiple sets of biomass in warm water to compensate for bacteria's metabolic slowdown in cold water.
- **Polishes BOD and TSS** first, as nitrifiers only thrive when BOD is <25 mg/L.

**R&D enables SAGR to get smaller, more cost-effective**

“The updated SAGR design represents a 35-65% reduction in size, as well as a cost reduction bolstered by a broader rock specification. What hasn't changed is its ability to reliably achieve non-detect ammonia in near-freezing lagoon effluent.”  
- **Martin Hildebrand**, Axius Water CTO, Nexom founder, and SAGR co-inventor

Learn more at [nexom.com/sagr](http://nexom.com/sagr)



*technologies for cleaner water*

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Axius Water companies

## How the SAGR works

The SAGR is a submerged, attached-growth reactor in which lagoon effluent flows through clean aggregate media. Using linear aeration across the floor of the bed, the SAGR maintains high dissolved oxygen (DO) conditions throughout, while (in a typical configuration) water flows horizontally from influent distribution and effluent collection chambers that prevent short-circuiting within the bed.

## Designed to be better

Thanks to an environment optimized for internal digestion, a SAGR has no significant build-up of solids. Systems in operation after 15 years continue to have unconstrained hydraulic conductivity, and sludge accumulation models suggest, under design conditions, it will not foul within 40-60 years of installation.

## Nexom knows lagoon treatment

The Nexom team has specialized in biological treatment for 25 years, covering 700+ projects across the U.S and Canada. Our engineers are leading experts in a range of technologies and invented SAGR cold lagoon nitrification, enabling some of the world's coldest inhabited regions to achieve year-round ammonia compliance.



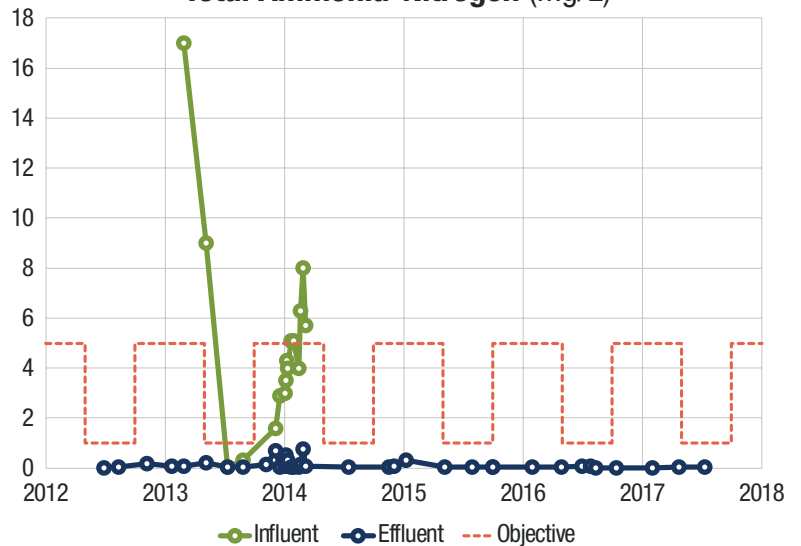
## Manitoba First Nation replaces SBR with SAGR for ammonia compliance

Long Plain First Nation (LPFN) is an Ojibway and Dakota community located 90 minutes west of Winnipeg, in Manitoba's Central Plains region. In 2009, the LPFN wastewater treatment facility's sequencing batch reactor (SBR) was no longer meeting effluent quality regulations due to both the age of the facility and population growth.

In order to take advantage of the low O&M requirements of a lagoon while both producing the effluent quality needed to protect fish and wildlife and also continuously discharging through winter, engineers for LPFN chose a two-cell partial-mix aerated lagoon followed by SAGR® cold water post-lagoon reactor for ammonia removal. They also included two vertical-flow, continuous back-wash sand filters with alum addition for phosphorus removal.

Construction of LPFN's new wastewater treatment facility began in winter 2011 and completed in May 2012. After construction, Nexom field staff and engineers provided commissioning and operational training in June 2012. Since then, the site has consistently met federal regulations for all parameters.

Long Plain First Nation, Manitoba SAGR Total Ammonia-Nitrogen (mg/L)



## UPGRADING WITH A SAGR IS EASY AND EFFECTIVE

1

We walk you through exactly what project details we need. Call 888-426-8180 or email [info@nexom.com](mailto:info@nexom.com).

2

We supply design-ready drawings, proprietary technologies, and responsive support.

3

You never worry about your cold lagoons' ammonia (or BOD, or TSS) limits again.