

James Smith Cree Nation Holds Open House at their IBROM Water Treatment Plant



At the JSCN water plant, back row, left to right: Ryan Arnold, Bullée Consulting; Lawrence Lukey, Bullée Consulting; Roger Chapman, Sapphire Water; Councillor Alvin Moostoos, JSCN; Frank St. Marseille; Bill Marion, JSCN Director of Public Works; Adam McMurtry, Sapphire Water; Derek Schultz, Sapphire Water. Front row, left to right: Jude Drouin; Dr. Hans Peterson; JSCN Chief Justin Burns; Robert Gray, President, Sapphire Water; PAGC Vice-Chief Brian Hardlotte

RON MERASTY PHOTO

By Ron Merasty

On November 19, 2015 James Smith Cree Nation welcomed about 50 people for an open house at their Integrated Biological Reverse Osmosis Membrane water treat-

ment plant. The attendees were a mixture of First Nations, James Smith Indian Reserve residents, including JSCN Chief, Justin Burns, visitors from Stanley Mission, industry representatives, two representatives from the Water Security Agency, and the main

presenter, Dr. Hans Peterson.

Dr. Peterson is the creator of IBROM technology which he developed with trial and error at Yellow Quill from 2002 to 2004 over a period of 22 months.

JSCN's Director of Public Works, Bill Marion, called the system "impressive," expressing his thanks to Indigenous Affairs for funding the technology.

"This technology is out there – it's not just here in Saskatchewan," Marion said. "It's something that's going to benefit, not just First Nations in the future, but when we talk about this type of treatment process, it makes undrinkable water drinkable."

The technology, Marion said, met not just "local standards, but national standards and even international standards. We talk about sustainability for First Nations – this is the type of technology that, definitely, assists First Nations in pursuing sustainability."

"I think it's very worthy to advocate and promote this type of technology that's available in this plant, not just within Saskatchewan, but nationally, because... this is the type of treatment technology that's going to be there in the future."

The JSCN plant has groundwater as its raw source, piped from a well about four kilometres away.

Chief Burns said his membership is "drinking good, quality water, and that's one of the things we can never take for granted, is that one of the basics of life is the water that we have, that we drink every day."

Their old water treatment plant, he said, was always in need of fixing but with their IBROM Burns expects a working lifespan of 25 to 30 years.

PAGC Vice-Chief Brian Hardlotte congratulated James Smith Cree Nation saying, "It's a state-of-the-art facility. Everybody needs water to live. It's good to drink. The people of James Smith have clean water to drink."

Peterson mentioned the Ashkelon plant in Israel which has sea water as its raw water source. It has some 20,000 Reverse Osmosis membranes (James Smith's has 8 and the membranes are similar), and supplies about 13% of the water supply for the country.

"If you look at what you have here (at JSCN)," said Peterson, "it's also an RO plant – that's the fastest growing technology on earth. Every year you look – while most technologies are going down; RO technology is going up. We've been trying to keep up with the pace."

Peterson mentioned a convention he attended in the Canary Islands where he spoke about IBROM's biological treatment of raw water in conjunction with RO treatment. The Safe Drinking Water Foundation's (founded by Peterson), website describes the process as such: "IBROM...uses microorganisms to remove contaminants such as iron, arsenic, sodium, and sulfate (from the water)... instead of using oxidants or chemicals that are commonly used in conventional treatment systems."

"IBROM utilizes naturally occurring bacteria in a controlled environment to remove the contaminants from the treated water. Following this process the treated water then goes through a Reverse Osmosis membrane and then slight amounts of chlorine are added to prevent contamination in the distribution system. What's interesting is that the IBROM renders water so pure that the treated water must pass through a mineral bed of calcium and magnesium to increase the pH and add nutrients that are beneficial to human health."

The IBROM system is currently operational in 15 First Nations with two First Nations – Mistawasis and Sturgeon Lake (SK) – scheduled for construction in 2016.

Peterson said that in 2004 after 22 months at Yellow Quill, he had a "working process." However, it was not 100% figured out at the time, but in the end all the problems were solved and what was produced was a safe drinking water that tasted good.

In explaining how the water is treated, he said, "What we start with is biological treatment. We have three tanks here, right? (The JSCN tanks appear to hold perhaps 750 gallons each.) So the water is pumped from the well. It goes through those three tanks, those are biological tanks, and then the water comes out of those three tanks, and it's biologically stable."

"That just means there are no nutrients for bacteria, there are no energy or nutrient sources for bacteria – there is nothing they can eat."

He likens any water source as a "smorgasbord" of food for bacteria. The biological treatment eradicates that smorgasbord, so that there is not a scrap of food for bacteria, and the bacteria disappear.

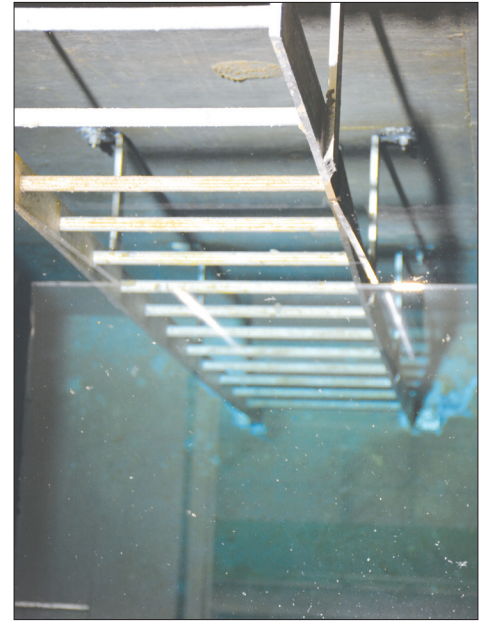
"That's when we can say we have biologically stable water," Peterson said. "That's when we can say we have safe drinking water. That's when we have no loss of chlorine residuals in the distribution system and so forth."

... continued on page 9

James Smith Cree Nation Holds Open House at their IBROM Water Treatment Plant



The Stanley Mission Project Management Team for all capital projects, back row, left to right: James Crawford; Gordon Hardlotte, Director of Operations; Elder Joe Roberts; Larry Charles, Public Works; Bob Hergott, Associated Engineering; Wayne Kabatoff, Project Manager. Front row, left to right: Councillor Linda Charles, Councillor Bernice Roberts, Councillor John Roberts; Glen Gillis. There are no NHL veterans in this lineup. RON MERASTY PHOTO



One can see down to the bottom rung of a 12-foot ladder in JSCN's treated water reservoir. RON MERASTY PHOTO

... continued from page 6

In reading scientific journals in those 22 months at Yellow Quill, a time when he wished he was anywhere but, Peterson then concluded, "That's what we've got to do, and that is what we ended up doing with the biology."

After biological treatment the water, now cleaned of contaminants, is run through RO membranes that have holes 30,000 times smaller than the width of a human hair. It filters the water to an incredible degree.

Because the smorgasbord has been wiped clean it "is the reason why we have communities now that have RO membranes now for 11 years without having to clean the membranes," Peterson said.

The IBROM system has improved over time, from a 1.0 at Yellow Quill, to 2.8 at JSCN, and in 2016 it's going to be 3.0 at Mistawasis First Nation and Sturgeon Lake First Nation.

If 15 First Nations have the IBROM

technology, there are many others who have "tried to apply conventional treatment to First Nations water and we've failed miserably across the country."

One of those old technologies is the manganese greensand process which has proven to be ineffective in treating groundwater. It will work for good quality surface water such as can be gotten in Calgary or Saskatoon. One cannot run manganese greensand-treated groundwater through RO membranes because they will clog up. When you clean them even once, the membranes get damaged.

Manganese greensand effectively treats only three problems in either of surface or groundwater. Peterson says he counted thirteen problems. IBROM can get to the thirteenth step.

"Now, we have counted up to twenty problems in surface water and in groundwater, and we're going to be happy with Manganese Greensand that can treat three problems?" asks Peterson rhetorically.

Peterson pointed out another problem in conventional water treatment plants, like the one in Saskatoon, which sends some smorgasbord into that distribution system. It has not filtered out all that food for bacteria. Bacteria lining the distribution system will have a source of food.

The SDWF website states: *The IBROM system is more cost-effective and environmentally friendly than conventional treatment systems, such as manganese greensand. When a ten-year operating budget is taken into consideration the IBROM is undoubtedly the system of choice, with low operating costs.... IBROM is significantly more cost-effective and environmentally friendly than the conventional manganese greensand process. It is estimated that George Gordon's IBROM produces \$100,000 in savings annual from the reduction of chemical costs, infrequent membrane cleanings, and reduced labour costs.*

Peterson thanked all the people who assisted in bringing the technology into

being, some of who were at the open house. They included: engineers from Bullée Consulting in Saskatoon, Lawrence Lukey and Ryan Arnold; Robert Gray, President of Sapphire Water, along Tim Strunk and Derek Schultz, Adam McMurtry, Roger Chapman, and Scott Rudig.

When Peterson was developing the IBROM at Yellow Quill, he said Chapman was always there and so asked him why he was there so often. The answer given was, "Because I believe this is the future of water treatment."

He also thanked TSL Mechanical, "the best mechanical contractor in Western Canada," and Miner's Construction of Saskatoon, who built the JSCN plant, "a very good construction company."

"I thank First Nations for trusting us to do so many water treatment plants, and we will always be that for you in making sure that everything's always going to be great," Peterson said.