



# CLEAN LIVING

FIRST NATIONS & WATER



CANADA'S FIRST NATIONS ARE STRUGGLING TO ENSURE THAT THEIR PEOPLE HAVE ACCESS TO CLEAN WATER AND HEALTHY ENVIRONMENTS.

# CLEAN LIVING

BY BRONWEN PARSONS

“We’re looking at 130 Walkertons,” snaps Charles Fox, Ontario Regional Chief of the Assembly of First Nations, when asked if Canada’s First Nations have problems with their drinking water, “You tell me!”

Matthew Coon Come, National Chief of the Assembly, sounded just as frustrated when he compared the condition on reserves to that of Third World nations following the release of a Health Canada report in April.

Coon Come laid the blame firmly on a lack of basic infrastructure: “You could open a new medical clinic on every reserve, but it still wouldn’t treat the root causes such as poor and crowded housing, and inadequate sewage systems.” He pointed out the dire health consequences: “Contaminated water spreads viral diseases such as hepatitis A, which is 12 times higher in First Nations children than the national average, and shigellosis — an acute and sometimes deadly intestinal illness, which is 20 times higher than the national average.”

That the state of water and sewage systems in First Nations communities is poor there is no doubt. Dr. Hans Pe-

terson, executive director of the Safe Drinking Water Foundation, couldn’t believe what he found when he first arrived at Yellow Quill First Nation in eastern Saskatchewan. The rank smell emanating from the water treatment plant hit him right away. The operator was struggling to make the sewage-tainted water safe by unwittingly adding a chemical that is supposed to be used only in boilers.

That was the simplest problem to correct. Four years later, Peterson is living in a trailer at Yellow Quill, working with Associated Engineering to try and solve the community’s ongoing water crisis. The reserve has been living with a boiled water advisory since 1995. The traditional water source is a creek that flows for only a few days during the spring when it is used to fill up a reservoir. Last year the creek was dry. This year, just as the water began to flow, the town of Kelvington upstream released its sewage overflow so Yellow Quill had to stop its pumps. The engineers have found a new ground water source and there’s a new treatment plant. However, the quality of the newly discovered water is so poor, Peterson says they have tested almost “every technology in the book” to make it drinkable.

continued on page 22

Illustration by Leo Yerxa

Yellow Quill's situation is bad, but it is far from an isolated case. At Woodstock First Nation, a Maliseet community along the Saint John River in New Brunswick, Chief Jeff Tomah says sewage has backed up into houses, the water supply pipes are cracking and "muddying things up," and several houses have to rely on bottled water. A state of emergency was declared in April by Cat Lake First Nation, an Ojibway community located 180 kilometres north of Sioux Lookout. The community has been on a boiled water advisory for two years, and the wastewater treatment plant, which has not been working right for years, backed up and raw sewage flooded the nursing station and surrounding residences. Ontario Chief Fox used the crisis to issue a terse press statement: "We need immediate action to correct this intolerable and inhumane situation," he said. "If our government won't help, perhaps we should appeal for humanitarian aid from the United Nations."

Indian and Northern Affairs Canada (INAC) is the federal department responsible for water and wastewater treatment plants on First Nations and it is certainly aware of the problem. Over the past two years the department has been sending consulting engineers to do walk-through assessments of all water and wastewater systems on reserves in the Yukon and south of the 60th parallel. The engineers assessed 740 water systems (those serving at least five homes) and 462 wastewater systems. The resulting report, "National Assessment of Water and Wastewater Systems in First Nations Communities," published in May, showed startling results. Using Health Canada's Guidelines for Drinking Water Quality as the yardstick (guidelines that are already less rigorous than those in the U.S.), the assessment found that about 29% (218) of on-reserve systems "posed a potential high risk that could negatively impact water quality." Another 46% were classified as medium-risk. Sewage systems fared little better, with 16% found to have effluent with "potential high risks." The study describes water contaminated with everything from turbidity to faecal coliforms to trihalomethanes. The causes it discovered included poor water sources, poor plant operation and inappropriate engineering design. A spokesperson at the Assembly of First Nations is more specific; the problems she cites are operators over-chlorinating the water, and design flaws such as intake pipes that are too close to sewage effluents.

## Bigger problems

First Nations' worries about having access to clean water are only part of a litany of problems and political issues they are confronting. In April, a caravan of chiefs and elders from across Canada converged on Parliament Hill to denounce Bill C-7. The chiefs dismiss the proposed First Nations Act as mere "tinkering" with obsolete and colonial legislation. Land disputes and treaty issues continue to grind slowly through the courts, while tensions erupt in violent stand-offs

such as at Oka and Burnt Church. The residential schools issue remains unsettled; native people want compensation for the decades when children were taken off to government and church-run schools where they were sometimes abused and were forced to give up their own culture and languages.

First Nations also face internal problems. Funds have been mismanaged in some bands; there is huge unemployment, alcohol and substance abuse, and domestic overcrowding. A recent Health Canada report paints a dismal picture. Issued April 3 this year, "A Statistical Profile on the Health of First Nations in Canada," based largely on 1999 figures, reported high rates of suicide (twice the Canadian rate, and 38% of all deaths in youths aged 10-19), high rates of injury and poisoning (three times the Canadian rate), high rates of smoking, glucose intolerance and obesity, and a lower life expectancy by five to seven years than the general Canadian population. One quarter of all First Nations births were to teenage mothers. Alcohol was implicated in 92% of vehicle accidents and 46% of suicides. One in five aboriginal youths reported they had used solvents, and one in three of those were under 15.

Compounding the social problems, on-reserve populations are growing. Birth rates are twice the Canadian average, making indigenous peoples the youngest and fastest growing segment of the overall Canadian population. As well, First Nations people are returning to their ancestral lands. By 2000, 58% of the people lived on reserves, an increase of 5% since 1991. The forecast is for on-reserve populations to increase another 3% in the coming decades.

The population growth is adding to the pressure for better water and sewage services. The Woodstock First Nation in New Brunswick is building 75 new houses that will be on a new distribution system, and Chief Tomah says they have another 80 families waiting to come back to the reserve from the U.S. and regions in Canada. These remote communities therefore are not only struggling with failing plant equipment, but also trying to find new sources of water to meet the growing demand. Too often there simply isn't enough water to go round. The impact is broad, affecting general sanitation. As the Health Canada reports points out: "During water shortages, a person might be forced to choose between cleaning and cooking with available portable water, both of which are necessary to promote good health."

Engineers at UMA in Saskatoon have been working with First Nations for 25 years. Don George, P.Eng., vice president and Saskatchewan regional manager, says water shortages are one of the biggest problems. The cause is not so much the recent drought, he explains, as the fact that equipment designed for 700 people 10 years ago now has to supply 1,200 people. Operators sometimes find the reservoir levels are so low they have to restrict the water use, and in extreme circumstances have to shut supplies off completely in order to reserve enough for fire protection.

continued on page 24



## CURRENT PROJECTS

Two consulting engineering companies who work with First Nations communities are Kerr Wood Leidal of Vancouver, and UMA of Saskatoon. They are applying a variety of new technologies and approaches.

One of Kerr Wood Leidal's current projects is a wastewater treatment plant in Alert Bay at the northern tip of Vancouver Island. In an unusual collaboration, the Namgis First Nation of about 900 people is building the wastewater treatment plant with the nearby non-native village of 600 people of Alert Bay. Faced with new provincial laws on discharging wastewater into the ocean, the two communities either had to build their own plants — an expensive option — or share a plant and a single outfall. They decided to cooperate and form a joint venture, and the \$4 million plant is under construction on the First Nation's land. Because they needed to fit the plant into a small footprint, the engineers recommended a sequencing batch reactor plant rather than the more traditional aerated lagoons. Previously Alert Bay had 70 raw sewage outfalls, whereas the First Nations band community had one.

One of the most useful technologies UMA engineers say they have been introducing in the past six years is a "low-pressure, low-volume" pipelines distribution system. Typically reserves have many outlying houses which either have wells or rely on water hauled by truck from a central plant. In the new system,

a polyethylene flexible coiled pipeline is buried in an economical and speedy trenchless process. Similar systems have been installed in about 20 First Nations and rural communities in Saskatchewan.

UMA is also using a relatively new technology in the Kawacatoose First Nation, a community of 1,200 people living 100 kilometres north of Regina. The community relies on ground water that has problems with iron, manganese as well as total dissolved solids, sodium and hardness. Eighteen years ago a filtration plant was added to rid the water of iron and manganese, but now the community is adding a membrane filtration plant with reverse osmosis treatment. The result is water so pure the nurses at the community were concerned that the lack of minerals would have a negative effect on people's health, so now they are blending some minerals back in. Membrane filtration plants have been installed in many First Nations communities across Canada, and the Assembly of First Nations' own newsletter recommends the technology, because it reduces chemical treatment and requires relatively little maintenance.

At the Southend Reserve of the Peter Ballantyne Cree Nation, 450 kilometres north of Prince Albert, UMA specified a conventional packaged plant to deal with potential surface water contamination. The community draws pristine water



John Delver, P.Eng. of Kerr Wood Leidal on site at Alert Bay, B.C.

from the nearby lake into two wells, but there is a danger of pollution from surface water run-off. UMA chose the package, which uses flocculation, coagulation, sedimentation and filtration with alum and polymer, because it is reliable and has been around long enough for the operators to be familiar with it. Kevin Ness, P.Eng., design engineer, says, "We don't see a problem with operators not being able to work the system, as computerized controls are so much easier to operate than they were 10 years ago now that they have interactive screens and automatic alarms. Besides, First Nations people are becoming much more computer literate."

## Light through the trees

Although the scene at First Nations might seem to be all gloom, there is light filtering through the forest. The Assembly of First Nations' own web site acknowledges that "the situation has greatly improved" since 1963 when the first national survey of socioeconomic conditions in First Nations communities was carried out.\* After Walkerton, moves to build improved water and wastewater infrastructure have intensified, and almost every week Indian Affairs announces a project on First Nations land. In the February budget, the federal government allocated \$600 million over five years to water infrastructure on First Nations. Indian Affairs also has a standard allocation for infrastructure of \$100 million a year.

Coon Come complains that the \$600 million is a "mere drop in the bucket" and says much more investment is needed. He points out that a 1996 Royal Commission recommended \$1.4 billion be spent annually for 10 years on the problem. First Nations people are even sceptical about how much of the money that has been allocated for infrastructure will find its way down to the communities themselves for actual improvements.

A development that is generating a great deal of hope these days, however, is the attention Indian Affairs is paying to ensuring new plants are built that are easier to maintain and operate. Even more important, the department is emphasizing the need to train First Nations operators. Many plants have fallen into disrepair after a few years because there is no expert to operate their sophisticated computerized controls and no budget for ongoing engineering and maintenance. Indian Affairs' May report says \$500 million should be spent on items like training and operations. Pierre Lamontagne, National Manager of Policy Development for Indian Affairs, places a great deal of importance on educating operators and is particularly hopeful about a "circuit rider training" program which tutors operators on the reserves and gives them access to a 24-hour help line.

Meanwhile, among First Nations people generally there is a sense that change is in the air and good things are starting to happen. The people are awakening to a new sense of identity. Dan David, a Mohawk journalist, wrote about his return to Oka in 1990 in an essay "All My Relations": "I feel I've found home for the first time in a long while. I left years before to get away from people grown used to silent resignation. I've returned to find people filled with pride, hope and even dignity." With this new-found confidence First Na-

When consulting engineers get involved with First Nations projects, they are often called in at the beginning to do the feasibility studies. Their role might be to find the best water source, or to recommend where to locate the treatment plant and pumping station, or what is the best water treatment process.

Often six or seven First Nations together form a tribal council, and they rely on the council to help them get a project started. The tribal councils have technical units that provide advisory services and help prepare the terms of reference. They will help in selecting an engineering consultant or construction manager.

To obtain funding from Indian Affairs, the community has to provide a business plan and demonstrate it has management capabilities. Each project has to be approved by Indian Affairs' regional capital management board, which will include members from Public Works and Government Services Canada. Sometimes, but not always, the board includes members from the First Nations. The project's cost has to be comparable to other projects of a similar type.

tions are venturing into new businesses. They're involved in unusual enterprises like wind farms, diamond mining, a cruise ship terminal — not to mention casinos.

Don George at UMA, and Bruce Richet, P.Eng. a senior vice-president in charge of community infrastructure at the firm, are aware of the changes. They say First Nations are taking a much more active approach to health and safety in their communities. And they say it's encouraging to see both the Band Councils and Indian Affairs paying more attention to the maintenance and operation of their water systems. Accountability is becoming much more front and centre, says Richet.

Until more First Nations people qualify as engineers

continued on page 26

*In 1963, the percentage of houses on reserves with running water was 13%. By 2001, 98% of on reserve houses had basic water, and 94% had sewer services. In 1963, the average age at death of First Nations women was only 34.7 years, compared with 64.1 years in the general population, and among men it was only 33.3 years, compared to 60.5 years in the general population. It was as a result of the 1963 federal government Survey of Contemporary Indians of Canada that the Department of Indian and Northern Affairs was created in 1966. Sources: Assembly of First Nations Fact Sheet, [www.afn.ca](http://www.afn.ca); INAC "National Assessment of Water and Wastewater Systems in First Nations Communities," May 2003, p. 26.*

and technicians, consulting firms have to rely mostly on non-aboriginal people who have built up long term relationships with First Nations to do the work in these remote communities. Richet and the others at UMA have worked with northern communities since they were young engineers starting out.

Richet lived in La Ronge, 400 kilometres north of Saskatoon, for several years and appreciates how hard life can be for First Nations. “There’s nothing like getting right in and working beside the aboriginal people to find out who they are as a people and what’s important to them,” he says. “A lot have gone through hardships in life, working with meager surroundings and possessions.” He continues: “We find them very forthright, very truthful. If they have an issue they’ll tell you. ...We find them very good to deal with. Sometimes they live with a bit of a different clock than we do, but you get used to it.”

Richet says it is rewarding for consulting engineers when the whole community comes out to celebrate the opening of an infrastructure improvement. “Whether it’s a new water treatment plant, or a new subdivision opening up, the whole community celebrates. It really shows how important modern infrastructure is to these communities.”

Mike Dickens, P.Eng. of Kerr Wood Leidal of Vancouver, another firm that works with First Nations, spent years working with the Metlakatla community near Prince Rupert on the northern B.C. coast. The Metlakatla project was one of the first enhanced, slow sand filtration water treatment plants built for a First Nations community in B.C. It won the Schreyer Award in 1995, partly because it was a simple process that required only a couple of hours of maintenance a day.

Dickens has fond memories of being invited to potlatches to celebrate the opening of a new water or other infrastructure project that Kerr Wood Leidal engineered. “One thing about First Nations communities,” he says, “is that they welcome you with open arms.” Working in these communities opens new cultural horizons. “You experience things that you would never experience otherwise,” says Dickens, “all the way from the food, to the dancing to the songs.”

As joyful as these celebrations are, for First Nations the opening of a new water treatment plant is also serious business. It’s a life and death issue over a natural resource that has always been an important part of their birthright. Jim Taylor, P.Eng., head of quality assurance with the Ontario First Nations in Thunder Bay, has worked for 20 years trying to improve their conditions. “They struggle with the financing, they struggle with the bureaucracy; they struggle with the expertise,” he says. “For First Nations water is a good portion of their life. For many other people out there it’s a financing, a funding, a liability, due diligence type of issue. But for the First Nations people it’s health and safety — health and safety of their children, of their elders, of themselves.”