

Through the *Eyes of a Child*



# First Nation Children's Environmental Health



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by/par health nexUS santé

Union of Ontario Indians  
Anishinabek Health Secretariat  
2009



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Anishinabek Health Secretariat  
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## *Dedication*

To families and their children who have learned from experience the need for guarding against environmental hazards.

## *Foreword*

This manual looks at some of the environmental issues that are affecting First Nation children on and off reserve. The information provided is intended to support service providers in addressing the environmental health concerns of their clients in a manner that is culturally sensitive and strength based.

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# Acknowledgement

## Partnerships:

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Additional thanks are given to the Fetal Alcohol Spectrum Disorder (FASD) Program overseeing the project and the Ministry of Children and Youth Services who also supported this project.

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We also wish to express our tremendous appreciation to all of the First Nation families who generously submitted beautiful photographs of their children, reminding us of the true inspiration for this project.

## Disclaimer

The information and opinions contained within this manual represent the views of the author and the Union of Ontario Indians and is not officially endorsed by the Government of Ontario. While the participation of advisory members and key informants was critical to the development of this resource, final decisions were made by the Union of Ontario Indians.



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Ahnii-Boozhoo Kina Waya!  
(Greetings Everyone)

At the time of Creation, *Anishinaabe* was given the responsibility to protect and look after Shkagamikwe, our Mother Earth. This was established in the form of a sacred covenant. As Anishinaabe's descendants, we, the Anishinabek are stewards of the land, the water and the air. We carry this responsibility to this day.

We believe Mother Earth is the foundation of our people: the Anishinabek Nation. We regard every part of her as sacred. She is our historian, the keeper of events. She provides us with food, medicine, shelter and clothing. She is the source of our independence. We know that through the cord of life, all of humanity is connected to her. The well-being of our people today and generations to come, are directly related to our ability to live in balance and harmony with her.

We are deeply concerned that our Earth has become a vulnerable and abused place. Her magnificent forests have been rapaciously felled, her rivers and oceans polluted and her delicate atmosphere is contaminated. Unfortunately, our children and our elders are among those most vulnerable and like many indigenous nations, who live so close to the land, our people have begun to experience the ill effects of an unhealthy environment.

Through the creation of the *First Nation Children's Environmental Health Manual*, we have identified some of the most critical environmental health issues currently affecting our children today. We wish to express our sincere appreciation to Best Start Resource Centre at Health Nexus for creating an opportunity to give voice to our concerns and most importantly, identifying strategies to help individuals, communities and nations to initiate change.

We invite all native people to join with us and reclaim their sacred responsibility as stewards of the land. Let us work together to preserve the Earth, to respect all life and to evolve new strategies for our survival.

Chi-miigwetch,

John Beaucage  
Grand Council Chief  
Anishinabek Nation



Dear Readers:

I am very pleased to support this important manual, "First Nation Children's Environmental Health", undertaken by the Union of Ontario of Indians Anishinabek Health Secretariat.

All children are susceptible to the detrimental health effects caused by environmental hazards. However, First Nations children are particularly vulnerable to these effects due, in part, to the numerous barriers and obstacles many First Nations communities continue to face. Poverty, unsafe drinking water, contaminated source water, poor indoor and outdoor air quality, and unhealthy physical/ social environment are all factors.

One in four First Nations children live in poverty, compared to one in six Canadian children. Inadequate housing and living conditions associated with poverty, such as mould and overcrowding, continue to plague our communities and children. In relation, First Nations children experience a disproportionate burden of infectious diseases such as Tuberculosis, Hepatitis A and Shigellosis which is also associated with poverty.

Children's environmental health continues to be a priority public health issue for First Nations communities. With elevating health conditions among First Nations children, the cost of doing nothing will have major socio-economic consequences and create an even greater burden on the health care system in Canada.

We are reminded of the urgency of this issue as news reports of a two-mouthed fish found in the Athabasca region surface in the media. Aboriginal communities downstream of the oil sands have long expressed their concerns about how these developments are affecting the animals that they eat and their water.

The Assembly of First Nations continues to work on the determinants of health, including health, housing, environment, so that we address the issues at all levels.

Our Environment unit will soon be preparing an Environmental Health Toolkit that will provide relevant First Nations-specific information on environmental hazards, how to detect them and what to do about it. In addition there will be reference materials on how to trigger an environmental impact assessment, what the laws are and who to contact for assistance. The toolkit is meant to raise awareness and promote action.

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I would recommend that readers also take the time to examine the First Nations Wholistic Health Strategy which addresses the unique determinants of health relevant to First Nations communities. This strategy emphasizes the interrelationship of the determinants of health, addresses health issues, considers community initiatives and may be used in making policy recommendations around environmental health and First Nations children.

Every child deserves to live in a healthy environment. Together we can all work together to improve the health of First Nations children.

Sincerely,



Phil Fontaine  
National Chief



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# Table of Contents

Introduction .....	8
Medicine Wheel .....	9
Vulnerability of Children .....	12
Environmental Health Concerns for Children .....	13
<b>Air .....</b>	<b>23</b>
Tobacco use.....	27
Pesticide and Herbicide Use.....	30
Household Chemicals.....	32
<b>Earth .....</b>	<b>35</b>
Food Source Contamination .....	38
Soil Contamination .....	41
Waste Management.....	43
Housing.....	45
<b>Fire .....</b>	<b>51</b>
Heating Sources.....	53
Emissions from Combustion .....	56
<b>Water .....</b>	<b>59</b>
Water Contamination.....	62
Breastfeeding.....	68
Fishing.....	70
Policy and Program Implications .....	72
Resource List.....	75
Appendix .....	84
Kanian'Kehaka (Mohawk) Prayer of Thanksgiving: A Good Morning Message/Prayer .....	88
Handouts .....	89

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## Introduction

“Our mother is very sick and when she’s sick she can’t take care of her children. It is now up to our young people to carry on with what we are doing and saying about the state of our Mother Earth. Men, women, and children must work hand-in-hand, together, on this problem.” (Quote by Josephine Mandamin in an interview with Kalvin Perron, 2005)

Children are sacred gifts from the Creator. They are the fruit of generations that came before and represent the seeds of future generations. Unfortunately, children are being exposed to increasing amounts of environmental pollution and hazards. Environmental hazards impact the health of men and women including their ability to conceive. Continued exposure to contaminants through pregnancy and early childhood can affect the development and health of the child. Science is demonstrating links between exposures to contaminants and increasing negative health outcomes including birth defects, cancers, respiratory illnesses and developmental disabilities.

Interviews with First Nation service providers in the fields of health, social and environmental services as well as existing literature demonstrate that First Nation people are aware of the environmental and health concerns facing their children. The identified areas of significant concern include disruptions in the food chain, changes in cultural and traditional lifestyles, water quality, and exposure to contaminants through air, food, water and soil. The impact of these environmental hazards on individual children’s health is the same for the First Nation and non-native population; however the risk of exposure to certain environmental concerns is higher in some First Nation communities.

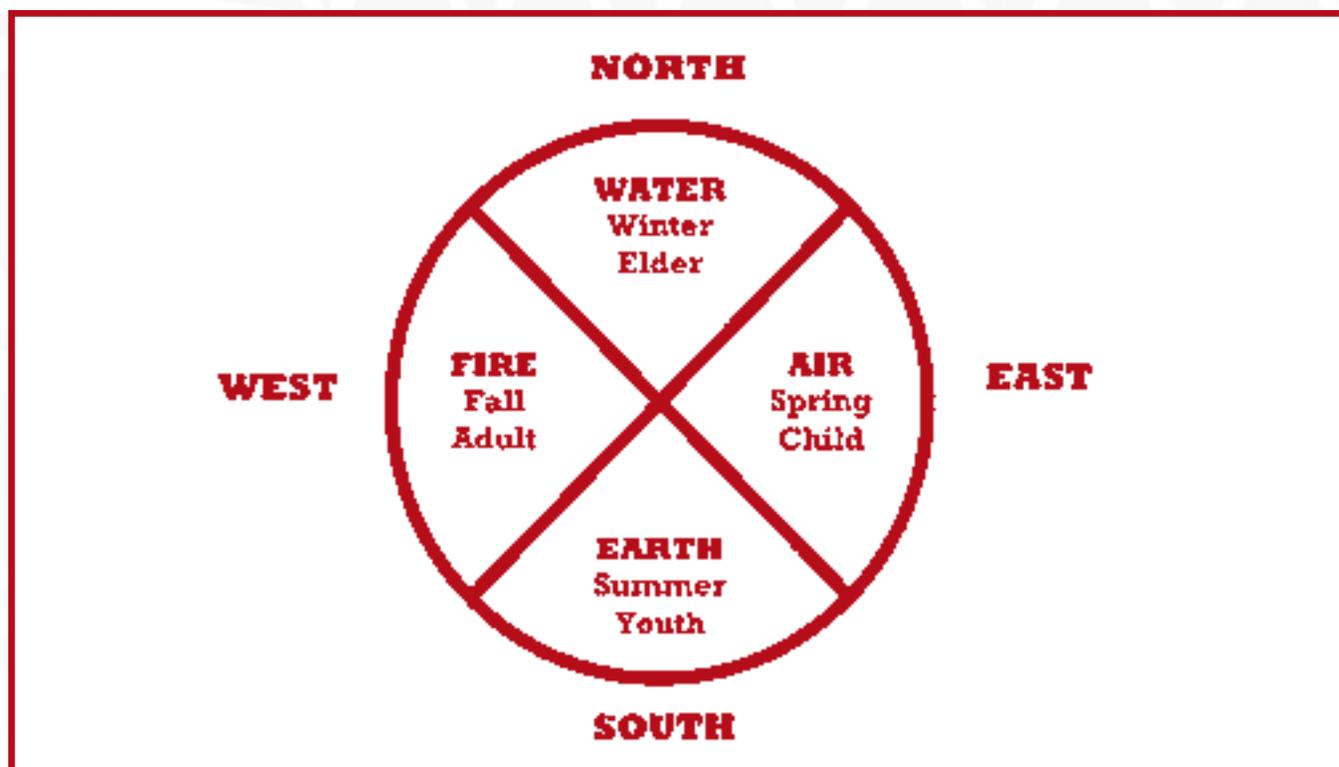
First Nation people have been identified as a vulnerable population when it comes to environmental exposures. Their close ties to the land, lower socio-economic position, lower education levels, and cultural practices make them among the first to feel the effects of environmental hazards. Lower socio-economic status leads to more overcrowding in homes, residence in lower income areas, substandard housing and reliance on unhealthy food sources. Education level is directly related to the socio-economic condition and a person’s ability to understand and respond to the complex environmental issues affecting their health. Cultural practices rely heavily on the connection with the environment. These practices may be disrupted when the environment changes through global warming and migration of contaminants.

This manual looks at some of the environmental issues that are affecting First Nation children on and off reserve. The information provided is intended to support service providers in addressing the environmental health concerns of their clients in a manner that is culturally sensitive and strength based.

## Medicine Wheel

"We have to go through all the elements of Air, Water, Earth and Fire in our life cycle. They are all interconnected and have a purpose."  
~Elder Gordon Waindubence, 2008

The Medicine Wheel has been used by First Nation people since time immemorial to teach about all aspects of life and nature. The Medicine Wheel demonstrates how all things interconnect and are bound to each other in the circle of life. Although the teachings may vary from cultural group to cultural group, the fundamental concepts of balance and harmony do not change.

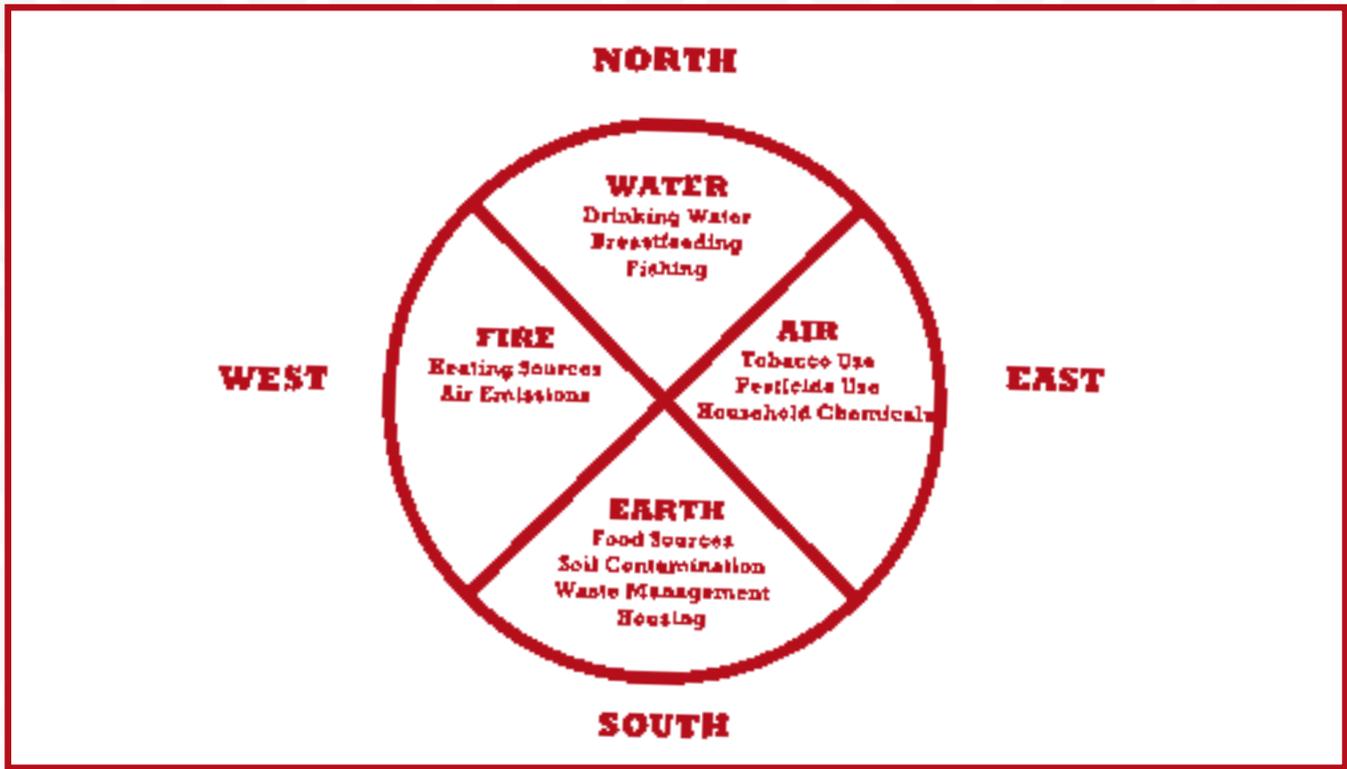


This manual uses the four elements of Earth, Air, Water and Fire to organize and explain the environmental concerns facing First Nation families. Each of these elements relies upon the other to ensure its health and well-being. When one element is negatively impacted the repercussions are felt by all the elements. Particular attention must be paid to those environmental hazards that, by their very nature, or because of how they are used by the broader society, negatively impact two or more elements of the interconnected wheel.

### An example:

Air pollution becomes soil and water pollution when airborne particulates mix with rain and fall to the earth and to our lakes and rivers. The contaminants are absorbed into the soil and affect plant growth or move into the aquatic food chain. They will also leach from soil into groundwater sources. The water or plants are consumed by animals, which are later consumed by other animals or humans. When contaminated products or natural vegetation are burnt either through industrial burning, home heating or forest fires, they release the contaminants back into the air and the cycling continues.

Under each of these elements, environmental risks associated with the element are defined and discussed. Teachings provided by traditional elders are used to explain how First Nation people are connected to the element, how they are affected and the impact they have upon the environment, including what they can do to address environmental risks.



The Medicine Wheel teaches about how balance and harmony are necessary to life. It introduces the four aspects that make up a human being (mental, emotional, physical and spiritual) as well as the life cycle of the individual and nation. These teachings are closely linked to the elements of Earth, Air, Fire and Water. The cycle of life from conception to death follows the same path as the teachings of the elements and harmony. The ideal is a system of balance where each interconnected element is respected and treated with the honour that First Nations were taught at the beginning of time.

*"First Nation people are the environment. We are not separate. We reflect the state of our world."*

~ Ken Tabobondung, 2007

It is through the very teachings of the Medicine Wheel that First Nation people can find solutions to the environmental issues facing their communities. Through the understanding of the interconnectedness of all the elements and the necessity for balance, First Nations can take the steps to make changes to their health and well-being.

It is believed by the Elders interviewed that it is the future of the youth to find ways to connect traditional knowledge with modern science in order to create positive change. It is felt that although the youth are in a state of confusion about their roles and responsibilities, with the help and guidance of elders they will learn how to care for Mother Earth and stop the abuse. By understanding that as caretakers of the Earth, they must have respect for everything that contributes to their life and when they see a wrong being done, they must go and correct it. This responsibility does not just fall only to the youth of today but to the generations to come.

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## Importance of Children to First Nations

### Longhouse Teaching:

*"About a 1,000 years ago, there was a Peacemaker who came to our people when our people were fighting amongst themselves. The Peacemaker came and went to all the people and he convinced them that the violence must stop. After many years of working with them they finally agreed to stop the fighting. In order for the Peacemaker to have them remember what they promised he said that they were going to plant a tree of peace and they are going to bury all their weapons underneath that tree. That's when he made the predictions to them, he said: "Now all of you leaders that have accepted in all the Nations, that you have to stand in a circle around this tree for the day will come as these white roots that come from the bottom of this tree, they will go in the four directions. And they are supposed to spread the peace." He said: "It is going to go good for a very long period of time but the day will come when a people will arrive that they will not understand what that root means and so instead they will become afraid of it and then they are going to take sharp objects and they are going to hack at these roots. And then at that time the tree is going to start to fall. Join your hands tightly together, for when that time comes that tree is going to land on your arms and you have to hold it up. And you are going to be burdened with this weight, this heaviness. It is going to be in those times when many, many children will be born and some of them will look in your directions and they are going to notice how tired you are burdened with this weight. That is when all those children are going to say to themselves, "Let's go help them, let's go raise that tree again." And many of them will come running, they are going to put their shoulders underneath that tree and it will rise one more time but it will be for the last time."*

~Prophecy shared by Elder Jake Swamp, 2008

The passing on of traditional teachings and knowledge to children means giving them an identity. Identity is important for them to understand their responsibility to Mother Earth.

Elder Gordon Waindubence emphasizes the importance of giving our children their identity early in life so they grow up with the knowledge.

*My partner is a teacher. I always told her that she needs to give them identity. One day she asked me to come and talk to her class about culture. I didn't know what I was going to say or do since the children were barely walking. Could they understand anything I would say? They were so young I might have their attention for 10 minutes.*

*I brought my drum, my shaker and my medicines. I began by putting the drum in the middle of the floor. The children investigated the drum. They beat it with their hands and sticks. They began to sing their songs. My partner had been teaching them about the drum and songs. When they became bored with the drum, I brought out my shaker. They touched it, put it in their mouth and beat the drum with it. They again began to sing their song. After about 10 minutes, they were losing interest so I brought out my medicines. I started a smudge and put it in the middle of the floor. Again they touched and smelt it. Then they started to move the smoke over their bodies. They scooped it with their hands and pushed it over their bodies. These children had their identity. They knew where they came from.*

~Paraphrase of Elder Gordon Waindubence, 2008

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# Vulnerability of Children

## Greater Exposure and Sensitive Life Stages

There are three basic differences that set children apart from adults with regard to exposure and effects of environmental contaminants. These differences are physiological, developmental and behavioural. Children also live longer than adults with the result that children are exposed for a longer period of time than adults with exposure occurring during sensitive developmental stages (Canadian Partnership for Children's Health and Environment - CPCHE, 2005). Currently, a First Nation female has a life expectancy of 76.6 years while a First Nation male has a life expectancy of 68.9 years (First Nation and Inuit Health Canada, 2007). This means up to 77 years of exposure and reaction time if the prenatal stage is taken into consideration.

The most basic difference between children and adults is that children are still developing. In the womb and throughout childhood, there is constant growth and development with many different windows of vulnerability. Exposure to contaminants may cause harm that would be unlikely to affect a fully developed adult. Pregnancy is the most vulnerable time and different risks occur at different stages of the pregnancy. For example, prior to conception, exposure to contaminants may affect fertility and egg/sperm quality. Prenatal exposures, where contaminants pass through the placenta, have the potential to interfere with healthy development leading to possible birth defects in early pregnancy or harming later brain function if exposure occurs during late pregnancy. Vulnerability continues from birth and throughout childhood, even into adolescence as children's bodies continue many different developmental processes.

Behavioural differences can increase a child's exposure to contaminants. Children depend on adults to make important decisions regarding the household, food and activities, which may expose them to different levels of contaminants. Children spend a great deal of time close to the ground where there can be increased exposure to pesticides and contaminants in soil or dust as well as air pollutants that tend to concentrate nearer the ground in a child's breathing zone. Children explore their world through all of their senses including tasting and touching. This behaviour puts them at risk of coming into contact with contaminants in soil or indoor dust, household chemicals and pesticides. Older children have a wider range of exploration and can come into contact with additional contaminants through outdoor play and recreational activities.

Compared to adults, children consume larger quantities of food and water per unit of body weight. They also breathe faster than most adults and their lungs have a comparatively smaller (and still developing) internal surface area. These differences expose them to larger quantities of any contaminants contained in air, food or water. Since children spend up to 90% of their time inside, indoor exposure are a big concern. These can include tobacco smoke, pesticides, household chemicals or contaminants that are shed from normal wear and tear such as lead in old paint or flame retardants from many different consumer products. There may also be biological hazards such as mould and pet dander. Recreational activities pose hazards from the chemicals used in swimming pools, exhaust gas found in ice rinks and exposure to chemicals in art supplies.

Physiological differences between children and adults can result in a child being more exposed to contaminants at times when the body is least able to cope with them. Through breathing, eating and drinking, skin contact, metabolism and digestion a child's body can react differently than an adult. The liver does not develop the adult capacity to filter toxic substances from the blood until at least six months of age. The kidneys, also a filtering mechanism for the body, are not fully developed until children reach the age of about 16 months. Absorption of contaminants also varies. For example, a child's body will absorb approximately 50-90% of ingested lead while adults only absorb about 10% of ingested lead (Toronto Public Health - TPH, 2005). An infant's skin is more permeable and will absorb more contaminants than an adult. Of major concern, the immature blood-brain barrier of a child continues to develop for at least the first three years of life making the early years of rapid brain development also a time of high vulnerability to contaminant exposures.

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# *Environmental Health Concerns for Children*

## **Developmental Neurotoxicants**

Neurotoxicants damage the brain and nervous system and developmental neurotoxicants can damage the developing brain. The brain is probably most vulnerable during pregnancy up to age three but brain development, and therefore vulnerability to these toxicants, continues to the end of adolescence. The impacts of very low level exposures to developmental neurotoxicants can include intellectual deficits, learning disabilities, vision or hearing problems, behaviour problems and, in the mother, impacts on thyroid function, which can damage fetal brain development. Included in the list of known developmental neurotoxicants are lead, mercury, dioxins, some pesticides and solvents, and polychlorinated biphenyls (PCBs) (Environmental Defence, 2006; CPCHE, 2005). Many other chemicals are suspected to be toxic to the developing brain.

Exposure to neurotoxicants occurs mainly through food and water but also through the air (Canadian Association of Physicians for the Environment, 2008). Science has demonstrated links between prenatal exposure to developmental neurotoxicants and developmental and behavioural problems in infants and children. Impacts from low-dose exposures are subtle and difficult to isolate and study. Continued research is needed to determine the link between suspected neurotoxicants and health outcomes.

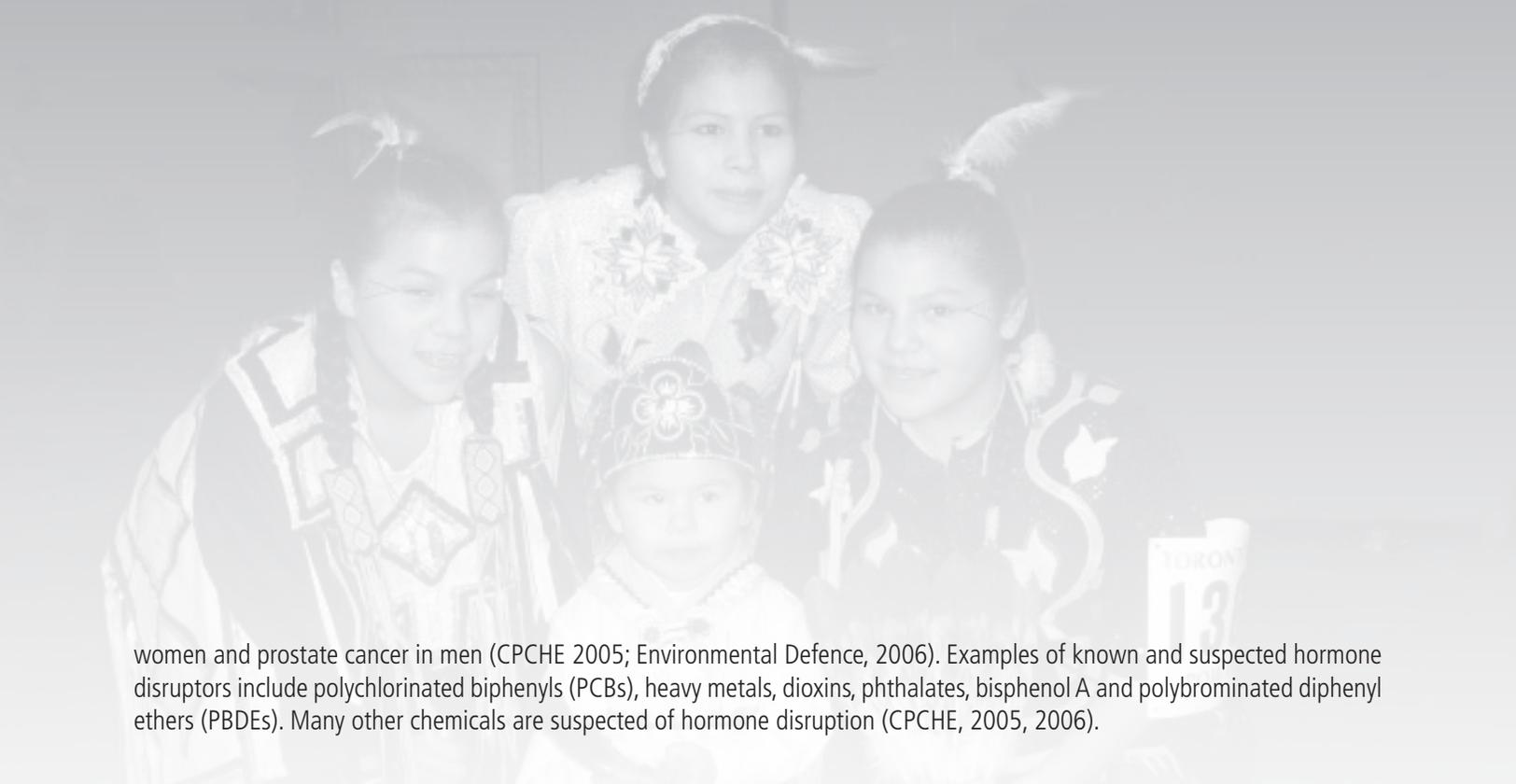
- Critical periods for brain development include the first trimester of pregnancy particularly 3-5 week's gestation as well as the entire third trimester when extremely rapid and complex brain development occurs (TPH, 2005);
- At birth, the child's brain is 25% the size of an adult's and will reach its maximum growth by age 10;
- The blood-brain barrier which protects the brain from chemicals is not complete until 6 months postnatal;
- Linking developmental neurotoxicants to health impacts is difficult because brain development is highly complex and problems can result from many factors. Moreover, exposures to very low levels of contaminants such as lead or mercury in the womb can contribute to subtle impacts on learning or behaviour that may not be apparent until much later in childhood (CPCHE, 2005).

## **Impact on First Nations**

Persistent organic pollutants (POPs) are well known neurotoxicants. They are often highly toxic, and often associated with multiple health impacts including damage to the developing brain. They are also resistant to chemical breakdown with the result that they accumulate in the environment. A study of exposure to persistent organic pollutants (POPs) in 99 First Nation people in the Sioux Lookout area showed a correlation to lower performances on cognitive activities. Testing showed that with increased exposure to toxins and body burden individuals had overall poorer performances. It is believed that First Nation's exposure to the POPs as well as other contaminants was linked to traditional lifestyle including hunting and fishing practices (Schwartz, 2001).

## *Hormone (Endocrine) Disruptors*

Some environmental contaminants can act as hormone disruptors, interfering with the normal functioning of the reproductive system and the many stages of human development, particularly during vulnerable stages in the womb. Hormones are produced at many sites in the body including the adrenal glands of the kidney, the pancreas and the thyroid glands. They are the chemical messengers in the body and the hormone or endocrine system is closely linked to the immune and nervous systems. Hormone disruptors can interfere with the production, transport, action and removal of hormones in the body. Hormone disruptors are linked to birth defects in the male reproductive system, problems with fertility, early onset of menstruation, puberty and cancer promotion at several endocrine sites including the two most common cancers in the adult population, breast cancer in



women and prostate cancer in men (CPCHE 2005; Environmental Defence, 2006). Examples of known and suspected hormone disruptors include polychlorinated biphenyls (PCBs), heavy metals, dioxins, phthalates, bisphenol A and polybrominated diphenyl ethers (PBDEs). Many other chemicals are suspected of hormone disruption (CPCHE, 2005, 2006).

## Impact on First Nations

Exposure to hormone disruptors occurs mainly from contamination of wildlife and other foods, including from food packaging. First Nation individuals rely heavily on a traditional food diet such as fishing and hunting which can be contaminated with heavy metals, pesticides, PCBs and PDBEs (Ship, 1997, CPCHE, 2005).

## Respiratory Toxicants

When respiratory toxicants are inhaled all parts of the respiratory system can be affected including the nasal passages, throat, bronchi and lungs. Tiny particles can also pass from the lungs directly into the bloodstream carrying on their surfaces a burden of toxic substances. Respiratory toxicants can be mild irritants that can aggravate asthma and promote infections or they can cause chronic long-term respiratory illnesses such as bronchitis, emphysema and cancer (TPH, 2005). Air pollution both indoors and outdoors is of concern. Key air contaminants of concern include volatile organic compounds, carbon monoxide, nitrogen dioxide, sulphur dioxide, ground level ozone, particulate matter and mould.

- A child's lungs continue to develop into adolescence;
- Asthma occurs in up to 12% of all children in North America, and about twice as frequently in children living in poorer conditions (Lebowitz, 2001);
- Since 1994, asthma prevalence has been increasing among children (except for boys aged 4–7 years). Boys of all ages have a higher prevalence of asthma than girls. Currently, approximately 20% of boys aged 8–11 have been diagnosed with asthma, the highest prevalence group among children (Lebowitz, 2001).

## Impact on First Nations

First Nation people have higher rates of tobacco use on and off-reserve than the non-native population. They have higher rates of asthma and are more likely to be hospitalized for a respiratory illness (Statistics Canada, 2008). Risk factors such as low incomes, poor quality housing and exposure to air pollutants mean First Nation people are considered a vulnerable population for exposure to contaminants.

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## Reproductive and Developmental Toxicants

Reproductive toxicants can affect the development and health of the reproductive systems of men and women especially the production and release of sperm and ova and the process of fertilization. Men are susceptible to reproductive toxicants throughout their lives since sperm development is an on-going process. Women develop and produce their total ova while in utero and are also susceptible to reproductive toxicants throughout their lives, especially during early pregnancy (CPCHE, 2006; Environmental Defence, 2006). Effects of reproductive toxicants can include changes in sexual behaviour, lower sperm count and lower quality sperm, decreased fertility and gestation time, decreased lactation, irregular menstruation, and negative pregnancy outcomes including miscarriage and stillbirth.

Developmental toxicants overlap somewhat with reproductive toxicants since they can also adversely affect a developing embryo or fetus. Exposure to developmental toxicants can result in spontaneous abortions or stillbirths, low birth weight, preterm delivery, birth defects, vision, hearing and intellectual deficits, chromosomal abnormalities as well as seriously debilitating conditions such as cerebral palsy (TPH, 2005, CPCHE, 2005).

Chemicals known or suspected of being reproductive and developmental toxicants include polychlorinated biphenyls (PCBs), PBDEs, lead, mercury, organic solvents, some pesticides, some phthalates and some air pollutants.

- From 1979 to 1999, the fertility of Canadian women aged 20 to 24 decreased nearly 40%, and fertility among those aged 25 to 29 declined about 25% (Statistics Canada, 2008);
- Women's infertility accounts for 40% of all fertility problems and can be linked to endometriosis, ovulation disorders, hormone imbalances, congenital abnormalities, and exposure to chemicals and radiation (Norris, 2001);
- Men's infertility accounts for 30-40% of fertility problems and is linked to low sperm count, low quality sperm or the inability to sexually function (impotence).

## Impact on First Nations

First Nation communities like Aamjiwnaang First Nation near Sarnia in southern Ontario, have linked environmental contaminants from local industry to skewed sex ratios (more females born than males). The Environmental Defence 2005 study Toxic Nation, found 36 chemicals released to the local environment in Sarnia that have been linked to negative reproductive and developmental outcomes. The chemicals released from factories can be found in communities located near industry such as urban centers, low income housing projects and in areas with natural resource production like those found around many First Nation communities.



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## *Carcinogens*

Carcinogens cause cancer, a condition of abnormal cell growth unregulated by normal mechanisms in the body. Known or suspected carcinogens include some pesticides, polybrominated diphenyl ethers (PBDES), several metals, polychlorinated biphenyls (PCBs) and air pollutants such as diesel exhaust and other vehicle emissions and tobacco smoke.

- Cancer in children is rare but incidence of childhood cancer has increased by 20-25% since the 1970's in larger countries such as the United States and in the European Union;
- While cancer is rare and not increasing among children in Canada, several cancers are rising significantly among young adults raising concerns about early life exposures, including during sensitive stages of fetal development (CPCHE, 2005);
- On average, 3,075 Canadians will be diagnosed with cancer every week;
- On average, 1,398 Canadians will die of cancer every week (Canadian Cancer Society, 2008).

## **Impact on First Nations**

Overall cancer rates for First Nation people are lower than the mainstream population but higher levels of tobacco use and exposure to environmental toxicants are linked with increasing incidences of lung and colon cancer.

## *High Dose vs. Low Dose Exposure*

Most research conducted on chemicals occurs in high dose clinical animal trials and is based on adult exposures. While some studies look at low dose exposures or immature life stages in animal tests, much uncertainty exists in predicting effects on a developing human fetus or child, especially the complex human brain. Biomonitoring of the general population has demonstrated that most individuals carry a body burden of low concentrations of numerous contaminants. Quite consistently, levels in children are found to be higher than levels in adults.

Most individuals will not come into contact with high dose levels of contaminants. The health impacts of low dose, multiple exposures over the long-term are not easily recognized or understood. It is difficult to replicate real life situations of chemical exposures and monitor the effects of a single chemical, or especially multiple chemicals, on the body since for each chemical there are often multiple avenues of exposure. Low dose studies are needed to determine possible subtle impacts of exposure on fetal and child development as well as long-term impacts that may affect individuals later in life (Environmental Defence, 2006; Canadian Environmental Law Association and Pollution Probe, 2004).

Biomonitoring can help to identify chemicals and contaminants of concern and vulnerable populations. The human body can naturally break down some contaminants over time but continuous and multiple exposures limit the ability of the body to thoroughly clean out contaminants. Persistent chemicals will tend to move into long term storage in the body, generally in fat (e.g., organic pollutants such as PCBs) or bone (e.g., metals such as lead) and can re-mobilize during pregnancy, lactation or significant weight loss. Lowering the body burden on an individual level requires minimizing exposure to contaminants and reducing or eliminating the contaminants in the environment. Breastfeeding can reduce the body burden of the mother but will pass contaminants to the infant through breastmilk. Although breastfeeding remains the best nutritional option for infants, studies are needed to determine exposure levels and transmission of contaminants (Nickerson, 2006). The main focus should be on reducing the contaminants in the environment including industry, household products, personal hygiene products and food sources (Environmental Defence, 2006).

## Male Birth Dearth Persists on Ontario Reserve

A small native community living in the shadows of Sarnia's chemical valley has had an unusual distinction: Researchers believe it has one of the most skewed sex ratios in the world.

For reasons that are not known, the percentage of male births in the community, known as the Aamjiwnaang First Nation, began to fall precipitously in the mid-1990's. By 2003, newborn girls outnumbered boys by about 2 to 1. It was a dramatic reversal of what is considered normal in human populations—a modest excess of male births—the trend that had previously prevailed on the reserve.

New figures on the reserve's birth rates presented yesterday at a conference in Sarnia indicate that the extent of the male birth dearth may be diminishing, although only slightly. In 2004, equal numbers of boys and girls were born, the first time since the mid-1990s that the reserve has had a birth ratio approaching normal. The next year, however, the number of baby girls once again exceeded boys. Figures for 2006 are not yet available.

Margaret Keith, one of the researchers who compiled the data, cautioned in the interview that annual figures comparing the number of male to female births in the small population can be volatile, but the longer-term trend to fewer male births seems to be persisting.

"Because we only have a year... where it doesn't look to far off, I just think it's too early to draw any conclusions" that the area is returning to normal birth ratio, said Ms. Keith, a researcher at the Sarnia office of the Occupational Health Clinics for Ontario Workers.

She said that over the past five years; only 42 per cent of births have been male, well under the national figure of 51.2 per cent. While she said she hopes the birth data will revert to normal "to me, it looks like the trend is still there."

The unusual birth ratio in the community, which has major petrochemical plants on two sides and is downwind of high-polluting U.S. power plants, has attracted world-wide attention. There is an international trend observed in many industrialized countries, including Canada, the United States, the Netherlands and Japan, to lower-than-expected percentages of male births, although the drop in large populations is very slight.

Nonetheless, the observation that the birth ratio is changing has fuelled speculation that long-term exposure to pollutants from industries might be a factor. Many researchers have been looking to the reserve for clues about the trend because it is a small community that is easy to study where residents are likely to have above-average exposure to many synthetic chemicals.

At the conference yesterday, organized by Aamjiwnaang and funded in part by Health Canada, experts said that the global trend to lower than expected numbers of male births is not fully understood, but its thought to be firmly established because it is being observed simultaneously in so many different places.

"This is a global issue. It's not something that's located either just in North America or for that matter in the Sarnia area," said Warren Foster, director of the Centre for Reproductive Care at McMaster University. "There is a weight of evidence that says that there is something going on."

He said the factors behind the trend "are very poorly understood," but that this year it evidence has emerged linking air pollutants and hormone exposures to these changes, among other factors.

Details on the sex ratio at Aamjiwnaang emerged in 2004, when residents of the community began remarking that they had no trouble fielding girls' sports teams while boys often complained of not having friends of their sex nearby.

A peer-reviewed scientific study on the birth ratio, published the next year in *Environmental Health Perspectives* and authored in part by Ms. Keith, estimated that there was only a 1-per-cent probability that the long period of low numbers of male births compared with females was a statistical fluke.

The sex ratio at a nearby reserve was found to be normal, suggesting the Sarnia trend wasn't due to cultural or genetic factors.

Scientists have observed that over time, about 106 males are born for every 100 females, a way that nature has compensated for higher rates of mortality among boys.

Mittelstaedt, Martin. "Male birth dearth persists on Ontario reserve." *The Globe and Mail*. 27 March, 2008: A8.

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## First Nation Response

Although First Nation people are aware of the hazards they are facing, not every community faces the same hazards to the same degree. This makes it hard to develop nation-wide or territory-wide environmental policies or manuals that will meet all the individual community needs especially with a large portion of First Nation people residing off reserve. This manual identifies environmental hazards and concerns that exist in some communities, and might develop in other communities as environmental changes continue to spread.

*"They have identified burial grounds here that are 5,000 years old. We didn't make the mess, why should we have to move? The solution is not to move us or they will have to move everyone from Fort William and the Tar Sands in Alberta and where would they put us? Every time they move us we lose our rights."*

~Ron Plain, 2007

First Nation communities and their leadership are taking steps to address the specific concerns facing their members and communities. These actions are not just aimed at addressing the well-being of children but include their families and overall community. These efforts include:

- Education campaigns aimed at school-aged children to increase their awareness of the impacts of environmental contaminants in food, water, air and indoors, especially in dust;
- Community awareness campaigns to assist community members to understand the concerns of their particular community;
- Development and implementation of environmental policies and programs within a community including: hazardous waste, water protection, habitat restoration, etc;
- Lobbying/negotiations by leadership to develop relationships with other governments to prevent and eliminate the most prevalent environmental hazards.

First Nation people and communities are addressing environmental issues in a number of ways including alternative energy projects or waste reduction projects. They are also working in the broader context of environmental change by lobbying internationally for greenhouse gas reduction, taking legal action against industry to reduce emissions and developing wildlife preservation programs. Although First Nation people are moving forward on environmental issues there is considerable concern about their ability to adequately address the problems their communities face. In particular, reserves rely on resources supplied by Indian and Northern Affairs Canada (INAC) to meet core infrastructure needs such as public works, which includes water and sewage treatment and hazardous waste management. Most interviewees and research sources named lack of resources, financial and professional, as being the greatest barrier to significant environmental improvements.

Other communities also lack the time needed to address their concerns. Some communities such as Akwesasne First Nation and Aamjiwnaang First Nation in southern Ontario face ongoing environmental hazards from emissions and toxic spills from local industry. These communities are busy trying to address daily hazards that directly impact their health and well being which means less time and energy working on long-term protection projects.

Ron Plain of Aamjiwnaang First Nation went to work for Environmental Defence feeling that in order to help his community he had to look at the bigger picture and bring attention to concerns from a broader perspective. He feels he can aid his community by making the issues a country-wide concern rather than an "Indian" concern.

Specific strategies are provided in each of the areas of this manual but on the broader scale there were a number of recommendations provided by the interviewees for individual families, communities and the government that are applicable to this manual.

### These recommendations include:

- Have the community identify their environmental concerns;
- Bring together key individuals from leadership, departments, health care practitioners, policy makers, youth, elders and interested community members;
- Develop policies and programs that blend traditional knowledge and science;
- Gather information on community's demographics to create a comprehensive profile of the community;
- After identification of both the community's strengths and needs, develop an action plan to address these concerns starting with prevention measures while working toward substantial policy changes;
- Medical personnel need training so they are aware of environmental hazards and their effects on health. This might lead to quicker diagnoses and improved access to appropriate treatment;
- Baseline studies should be completed on water, air, soil and individuals from a range of age categories to assist in long-term monitoring of environmental contaminants;
- Community research and analysis of water, soil, vegetation and animal (wild meat) should be completed through private laboratories and all reports made public. It is felt this will increase the likelihood of community members accepting recommendations and following guidelines;
- Community-based research should be completed that looks at the holistic impact of the environment. This includes cultural and traditional knowledge transmission and recording changes in traditional practices such as hunting and harvesting, and qualitative and quantitative information regarding community illness and other effects of environmental contaminants.
- Youth should be mobilized, consulted and involved in any actions by their community that addresses environmental concerns. This will increase the likelihood that any projects or programs will be sustained long-term and will meet their particular needs;
- Attention should be paid to the protection and preservation of traditional plants and medicines (ex. tobacco, sage, cedar, sumac, berries). This includes collection of seeds and samples so plants can be grown in greenhouses in areas where extreme contamination has occurred. Some First Nation communities have identified traditional harvesting areas and have begun to implement protection strategies;
- First Nation communities should clearly identify radioactive land areas and conduct awareness campaigns to assist community members in identifying areas safe for harvesting both wild edibles and medicines;
- Government needs to take responsibility and take the political action necessary to address radioactive waste buried in First Nation territory immediately;
- Communities need to support homeowners who are addressing environmental contaminants such as mould, septic and well problems. These concerns are currently the individual's responsibility but really affect the community as a whole. Support can include financial programs to help offset the costs of upgrades and maintenance;
- Inspect all community buildings such as daycares. Access funding to replace hazardous older buildings;
- Dietary programs need to address the cultural significance of wild food while attempting to eliminate the foods considered to most negatively impact the health of an individual such as pre-packaged foods, and foods with high concentrations of salt, sugars and fats.

Elder Gordon Waindubence has stated that First Nations can not continue to wait for the go ahead from their leadership, the provincial or federal governments to develop and implement a campaign to address their environmental concerns. His experience is that by waiting, communities run the risk of getting caught in the cycle of re-election and re-education that occurs every few years. In order to continue the momentum of environmental campaigns, communities must drive the change beginning with recognition of their place in the cycle of the environment and their impacts, negative or positive, on the environment.

*If I save a tree, I am saving not only that tree but also the bird that makes a home in that tree. That bird is responsible for waking up the world each morning through its song. If we all save one tree, then we are saving a piece of creation which has a larger purpose.*

~Paraphrase from Elder Gordon Waindubence, 2008

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A common theme from interviews held with elders was the need for individuals to take responsibility for their impact on the environment, recognize their responsibilities to themselves, their children, their communities and to Mother Earth. Women bring new life and are the keepers of the water. Men are the protectors and are responsible for fire. Elders are responsible for sharing the teachings while the youth are responsible for learning and carrying on the traditions. Unfortunately, many of these roles have been disrupted which has resulted in an imbalance. In order to create positive change to better everyone and everything, this imbalance must be corrected. A return to the teachings and culture provides the foundation for this change, while learning, adapting and implementing new ideas and technology will assist in correcting the problems facing individuals, communities, the nation and Mother Earth.

## **Métis Response**

It is recognized that Métis culture, heritage and legal rights are distinct from First Nation and Inuit culture. The experiences of Métis people regarding health outcomes and the impacts of environmental hazards would reflect the uniqueness of their culture and community. Attempts were made to include Métis specific information in this manual including responses from Métis service providers however interviews were not able to be completed in time for publication. Specific Métis statistics and information have been included throughout this manual however much of the information regarding specific community concerns reflect First Nation statistics. As this is a fairly new issue, we were unable to secure respondents who were able to clearly identify Métis specific issues.

A lack of accurate data and research information impedes the ability of health organizations to determine the overall health and well-being of Métis people. Although Statistic Canada Aboriginal Peoples Surveys from 1991 and 2001 data is considered the most informative and accurate information available regarding Métis people, there are concerns regarding the accuracy of the data due to how the population is identified and enumerated (National Aboriginal Health Organization, 2008). Health services are provided to Métis people through the provincial and territorial governments at the same level as the non-native population with no identification process (exemption is the Northwest Territories) in place to assist in data collection or improvements in services to Métis people. Métis people, like First Nation and Inuit, are faced with low socio economic status, lower education levels, and higher rates of illness and disease.



## First Nation Statistics

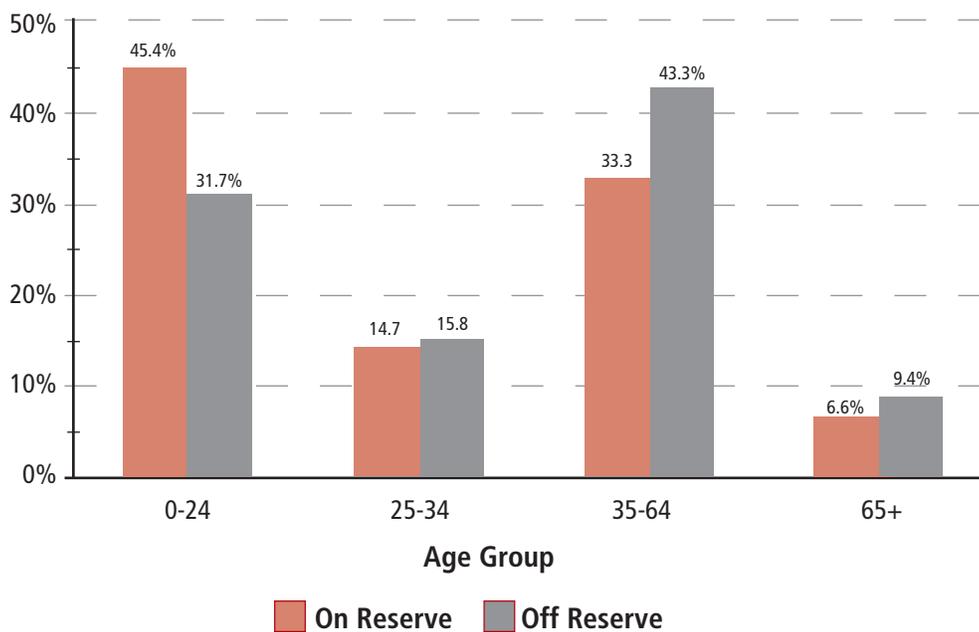
The following statistics have been compiled from reports and publications by Health Canada, Statistics Canada and the Canadian Institute of Health Information. Many of these statistics are nation-wide and focus on First Nation people who are identified under the Indian Act. Recent statistics from 2006 include some information on First Nation people that self-identified as First Nation.

- An estimated 40% of First Nation people lived on reserve, while the remaining 60% lived off reserve. The off-reserve proportion was up slightly from 58% in 1996;
- Censuses in both 1996 and 2006 found that about three-quarters (76%) of the off-reserve First Nations population lived in urban areas;
- 69% of the Métis population reside in urban areas (Statistics Canada, 2008);
- Ontario and the western provinces combined accounted for an estimated 577,300 First Nations people, or 83% of this group's total population. About 158,395, or 23%, lived in Ontario (Statistics Canada, 2008);
- 389,785 people reported themselves as Métis with 73,605 residing in Ontario (Statistics Canada, 2008);
- Children and youth aged 24 and under made up almost one-half (48%) of all First Nation people, compared with 31% of the non-Native population. About 9% of the First Nation population was aged 4 and under, nearly twice the proportion of 5% of the non-Native population. Similarly, 10% of the First Nation population was aged 5 to 9, compared with only 6% of the non-Native population (Statistics Canada, 2008);
- 25% of the Métis population are under 14 years of age (Statistics Canada, 2008);
- Children and youth made up a particularly large share of the First Nation population in several urban areas that were home to a large number of First Nation people;
- In 2006, the majority of First Nation children aged 14 and under (58%) lived with both parents, while 29% lived with a lone mother and 6%, with a lone father;
- First Nation children are twice as likely as non-native children to live in multiple-family households;
- Over the past decade, the proportion of First Nation people living in crowded homes has declined. In 2006, 11% of First Nation people lived in homes with more than one person per room, down from 17% in 1996. At the same time, nearly one in four lived in homes requiring major repairs in 2006, unchanged from 1996. Overall, First Nation people were almost four times as likely as non-native people to live in a crowded dwelling. They were three times as likely to live in a dwelling in need of major repairs (Statistics Canada, 2008);
- Type 2 diabetes is 3 to 5 times higher among First Nations people (First Nation and Inuit Health, 2005);
- 6% of the Métis population reported diabetes (Statistics Canada, 2001);
- Tuberculosis infection rates are 8 to 10 times higher (First Nation and Inuit Health, 2005);
- Except for male prostate cancer, First Nations cancer mortality rates are lower than those for the overall Canadian population. Acute myocardial infarction (AMI) rates among First Nations are about 20% higher than the Canadian rate, and stroke rates among First Nations are almost twice as high as the comparable Canadian figure (First Nation and Inuit Health, 2008);
- The most common causes of death for First Nations people aged 1 to 44 years were injury and poisoning. Among children under 10 years, deaths were primarily classified as unintentional (accidental) (Statistics Canada, 2008);
- According to the 2001 Census of Canada, on-reserve Registered Indians rate lower than the general Canadian population on all educational attainment indicators, including secondary school completion rates, post-secondary education admissions and completion of university degrees (First Nation and Inuit Health, 2008);
- In 2000/01, 98.2% of First Nations homes were evaluated as having an adequate water supply (First Nation and Inuit Health, 2008);
- Infant mortality rates are twice to three times as high in First Nations and Inuit communities (Canadian Institute of Health Information, 2008);
- Rates of diabetes (largely as a result of obesity) are higher among First Nation youth than among other adolescents (Canadian Institute of Health Information, 2008);
- There are 633 First Nations in Canada (Assembly of First Nations, 2008);
- There are 134 First Nations in Ontario (Chiefs of Ontario, 2008).



The following chart breaks down the registered First Nation population according to age and area of residence for Ontario (Indian and Northern Affairs Canada, 2008).

**Registered Indian Population, by Type of Residence and Selected Age Groups, December 31, 2006**





*Noodin*



*AIR*  
*Air*



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## Air

*"He (Waynaboozhoo or Original Man) looked up into the sky and noticed that the clouds were fleecy white, pure, and cold just like the snow at the tops of the mountains. He knew that high above the Earth there must be layers of air and elements that he had no name for. Nonetheless, he knew that something was up there that held it all together."*

~Eddie Benton-Banai, 1988

*"Thanksgiving includes everything. Every life form is the same including the Air. We all know the importance that we have to have clean air to breathe. Without it we know we are going to die. So we know that air is very important and that we have to ensure that it is kept clean."*

~Elder Jake Swamp, 2008

Air is necessary to all living beings. The four winds trade off to clean the air, bring the seasons and help with the cleansing of the earth.

*"The day will come when you look towards the sun and it is going to be hard to see the sun because there will be a dark cloud hovering overhead. That means pollution that will make a shadow between you and the sun. We are seeing this in some places in the world now."*

~Prophecy shared by Elder Jake Swamp, 2008

Air pollution affects everyone no matter where or how they live. Air has no boundaries; it travels from continent to continent without interference. Along with the wind come the contaminants that are released into the Air by industry and people. The elements of Earth, Water and Fire rely upon the Air to provide them with oxygen but they are also responsible to the Air. Trees and plants filter the air and clean it of toxicants, the water removes particles of contaminants from the air and the Fire changes the Air for use by plants.

*"The plants are going through hard times. We can see the effects of toxins in the browning of the tops of trees. The toxins in the air are taking away the plants ability to regenerate."*

~ Ken Tabobondung, 2007

When Air becomes contaminated with pollution, it in turn contaminates the Earth, Water and Fire. When the other elements are not able to deal with the foreign pollutants found in the Air then they accumulate and add to the pollution burden across all the elements. Humans ingest, inhale and absorb these contaminants when we eat, drink, breathe and go about our daily lives.

Air is polluted by emissions from industrial, residential and agricultural sources. The three areas of contamination identified in this manual are through the use of tobacco, herbicides, pesticides and household chemicals.

## Outdoor and Indoor Air Pollutants

Outdoor and indoor air quality varies according to the contaminants released into the air. The source of outdoor air contaminants is generally air emissions from industry particularly coal-fired plants, fossil fuel burning by individuals (ex. vehicles and residential heating). These contaminants contribute to smog and smog alerts. Smog is a mixture of ground-level ozone, small particulate matter and other pollutants. On days when smog alerts are issued, residents are urged to remain indoors and to watch for any health effects to vulnerable populations including children, the elderly or the chronically ill.

Indoor air quality can also pose a threat to health. The sources of indoor air pollution include wood or gas stove emissions, building supplies, fabric, and use of household chemicals, pesticides, cosmetic products and biological allergens such as pet dander, mould and dust (Environmental Defence, 2006; CPCHE, 2005). The most researched indoor air pollutant that impacts health is environmental tobacco smoke. There is a great deal of concern regarding the effect of indoor air quality on children, since children spend approximately 80 % of their time indoors whether at home, school or in recreational facilities (CPCHE, 2005).

There is particular concern for vulnerable populations such as visible minorities and the poor regarding exposures through poor housing, overcrowding and tobacco use.

Children in low-income households are more likely to live in substandard housing that can often contain elevated levels of lead, pesticides, mould, PBDEs and other contaminants (TPH, 2005). Low-income housing projects are often located in close proximity to industrial sites and roadways which increases exposure to air pollutants.

## Impact on First Nation Children

First Nation people are considered a vulnerable population. They are more likely to have poor health due to exposure to hazards related to poverty, poor nutrition, lower education levels, and tobacco use. "Most Aboriginal people are at or below the poverty line. In major western cities, four times as many Aboriginal people as other citizens are below the poverty line," (Indian and Northern Affairs Canada, 2004). Smoking amongst First Nation people is approximately three times the rate of the general population and smoking amongst youth 15 to 17 is also three times the rate of the general population. Many First Nation communities are located close to identified pollution hotspots including facilities that release such contaminants as lead, arsenic and volatile organic compounds (Hing Man Chan, 2006; Environmental Defence, 2006).

*Akwesasne First Nation (Southern Ontario) is located close to three industrial sites, which include automobile and aluminum manufacturers. Akwesasne has been addressing exposures to a number of industrial contaminants that have affected the air, soil and water quality of their community. Community members are addressing health issues such as impairment of cognitive learning ability, early onset of puberty, asthma and diabetes. Elders and community members have to travel outside of the community to harvest traditional medicines. The community formed the Akwesasne Task Force on the Environment to address environmental concerns. Community efforts include campaigns to educate community members, legal action against industry to reduce emissions and monitoring the contaminants in the community and in community members. For additional information, contact Akwesasne First Nation at 613-575-2250 or [www.akwesasne.ca](http://www.akwesasne.ca).*

~Ken Jock, 2007

News Articles for Akwesasne First Nation:

<http://www.akwesasne.ca/news/ASPSP/index.html>;

[http://findarticles.com/p/articles/mi\\_m0CYP/is\\_7\\_111/ai\\_105162048](http://findarticles.com/p/articles/mi_m0CYP/is_7_111/ai_105162048)

*Aamjiwnaang First Nation located close to Sarnia, Ontario is within 25 kilometres of 62 petrochemical plants. More than 200 chemical by-products or pollutants have been identified in the community. Health effects range from heart and respiratory problems to reproductive problems including increased miscarriages and skewed sex ratios (more females than males) (Poirier, 2007). The community has drawn attention to their environmental concerns by developing Toxic Tours to introduce the media and politicians with the contaminants surrounding the community. Their story is known internationally thanks to media coverage by well-known magazines and television like Chatelaine and CBC. For additional information, contact Aamjiwnaang First Nation at 519-336-8410 <http://www.aamjiwnaang.ca/>.*

~Ron Plain, 2007

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News articles for Aamjiwnaang First Nation:

<http://www.environmentaldefence.ca/toxicnation/press/releases/20060606.htm>;

[http://www.cbc.ca/health/story/2005/09/02/no\\_boys20050902.html](http://www.cbc.ca/health/story/2005/09/02/no_boys20050902.html);

[http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20070423/firstnation\\_ratio\\_070423/20070423/](http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20070423/firstnation_ratio_070423/20070423/)

## Tobacco use

*"The smoke from Tobacco will carry your thoughts into the Spirit World. Its smoke will be your visible thoughts. You must use Tobacco when you want to speak with your Grandfather, the Creator."*

~Eddie Benton-Banai, 1988

Tobacco is a sacred medicine given to First Nation people to communicate with the Creator. It is used in ceremony as an offering to the Creator to communicate thoughts and prayers (Ken Tabobondung, 2007).

After contact, tobacco became a commodity. It was used for trade and quickly became a major economic contributor. It has become a chemically altered commercialized product that is addictive, and is often used to cope with stress, emotional upset and to suppress hunger.

Beginning in the 1950's, studies have proven that Tobacco use increases the risk of lung cancer, respiratory disease such as emphysema, asthma, and bronchitis as well as incidence of cardio vascular disease (Aboriginal Tobacco Strategy, 2008). There are 4,000 chemicals contained within one cigarette, 50 of which are known to cause cancer. "About 90% of the content of cigarettes is plant matter. The remaining 10% is a combination of chemicals and other additives," (Alberta Alcohol and Drug Abuse Commission, 2007). These chemicals and additives are added to alter the taste and smell of the tobacco and increase the likelihood of addiction.

Second hand smoke exposes non-smokers to twice the level of nicotine and five times the level of carbon monoxide as the smoke inhaled by the smoker. "Nicotine can be found in the blood of pregnant women who are exposed to second-hand smoke," (Alberta Alcohol and Drug Abuse Commission, 2007). Second hand smoke can affect the growth and development of an unborn child by reducing the levels of oxygen and nutrients passed to the child by the mother. Children exposed to cigarette smoke have an increased risk of Sudden Infant Death Syndrome, respiratory illnesses such as asthma, bronchitis and pneumonia (Alberta Alcohol and Drug Abuse Commission, 2007) and are twice as likely to become smokers in their adolescence and adult life.

Women who smoke have an increased risk of fertility problems, as well as an increased risk of miscarriage, placental problems in later pregnancy, stillbirth and preterm labour. Infants born to smokers have higher rates of nicotine dependency, lower birth weights and developmental as well as physical abnormalities (Canadian Paediatric Society, 2006). Men who smoke run the risk of erectile dysfunction and fertility problems (problems with sperm). The health effects of smoking and second hand smoke have motivated some provinces and communities in Canada to ban smoking inside public spaces and in some cases in personal vehicles when children are present.

The range of chemicals contained within a cigarette includes everything from heavy metals to neurotoxicants. These chemicals are linked to health effects such as cancer, reproductive problems, adverse impacts on brain development, respiratory illness, circulatory diseases and diabetes. Beyond the health effects of tobacco are also the socio-economic effects. The use of tobacco is an indicator of addictive behaviour. Its use is often a link to additional addictive behaviour such as alcohol and drug abuse as well as gambling. Any strategy aimed to reduce tobacco use must also address other addictive behaviours and provide strategies for quitting (McKennitt, 2007).

## *First Nation Statistics*

- Sixty percent of on-reserve First Nations people between the ages of 18 and 34 smoke;
- The majority of on-reserve First Nations people who smoke (52%) started smoking between the ages of 13 and 16 (First Nation and Inuit Health Canada, 2007);
- Recent statistics indicate that the rate of smoking among First Nations people in Canada (59%) is still approximately three times the rate for the general Canadian population (Canadian Paediatric Society, 2006);
- Among 15- to 17-year-old (First Nation) adolescents, the rate of smoking among boys (47%) and girls (61%) is three times the national rate (Canadian Paediatric Society, 2006);
- 11.6% of the First Nation population (on-reserve) reported asthma, slightly higher than the 10.3% for the total population (Aboriginal Peoples Survey, 2001);
- 14.9% of the Métis population reported suffering from asthma (Aboriginal Peoples Survey, 2001);
- Among off-reserve First Nation children aged 14 and under living in non-reserve areas, allergies, asthma and ear infections or ear problems were the most commonly reported chronic conditions. Allergies were reported by 15.5%, asthma by 12.1% and ear infections or ear problems by 9.8%.



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## Traditional Tobacco Use

*“Tobacco is used by native people to represent the honesty that they carry in their hearts when words are to be spoken between two people or to the spirit world. When a request is made, a teaching is shared, a question is asked, or a prayer is offered, the tobacco travels ahead of the words so that honesty will be received in a kind and respectful way. Tobacco was seen as a gift from the spirit world. To offer tobacco is to pay an ultimate respect to that which you are asking.”* (Ontario Federation of Indian Friendship Centres, undated)

First Nation people have a special relationship with tobacco. It is the first medicine given to the people and it is offered when communicating with the Creator. To say that First Nation people must stop using tobacco would be asking them to eliminate a critical and foundational component of traditional culture.

Stop smoking campaigns have traditionally been designed to stop the overall impact of tobacco including exposure through second hand smoke. Most of these campaigns fail to take into consideration the cultural application of this medicine. There must be a distinction between traditional tobacco and commercial tobacco (McKennitt, 2007). The campaign: “Tobacco Wise” by the Aboriginal Tobacco Strategy integrates the stop smoking message with an understanding of the healing nature of traditional tobacco use. This campaign is intended to educate the general public as well as First Nation youth about the importance of tobacco to First Nation culture, while providing valuable information regarding the health effects of commercial tobacco use.

Traditional tobacco is used in its natural form. No additives have been used during growth or after the harvest to improve color, taste or smell. It is grown in a sacred manner and is used in a sacred manner such as offerings and ceremonies. The growing of traditional tobacco and caring for the plant brings into focus the teachings of the sacred medicine (Ken Tabobondung, 2007). Medicinal blends such as kinnick kinnick are considered a sacred blend of various medicines harvested to create the sacred mixture. As a result, the harvested blends do not contain the commercially produced mixture of nicotine and carcinogens (Laurie McLeod-Shabogesic, 2008). Commercial tobacco has many chemicals added to improve its marketability and is not grown or cared for in a traditional way. Although it can be used in ceremonies, it is commonly used as an addictive substance. There has been a resurgence of communities that grow their traditional tobacco and some efforts are being made to protect traditional tobacco from extinction (ex. former Traditional Native American Tobacco Seed Bank and Education Program from the University of Mexico).

*When a person is having strong feelings, they use what they have. They will break that tip off a cigarette (removing the paper and filter to gain access to the tobacco). It does not take away from the sacredness of the fire and prayer.*

~Paraphrase from Ken Tabobondung, 2008

*We don't know the state of the mind of the person when they prepared their tobacco bundles. We don't know what they are thinking. I know how to take care of the tobacco when I receive it.*

~Paraphrase from Elder Gordon Waindubence, 2008

By bringing into focus the sacredness of this plant and its ability to heal through ceremony and medicine, First Nation children learn that smoking is abusing this plant. Parents, teachers and community leaders have to make children aware of the harm of commercial tobacco and revitalize its traditional use (Ken Tabobondung, 2007). This includes positive role modeling by not smoking or using commercial tobacco products, including chew and snuff, and protecting the traditional use of this sacred medicine (McKennitt, 2007).

## Strategies

### Service Providers

- Use tools provided by your local health centre, government or other health agencies to assist in developing a community anti-smoking campaign. Some tools are included on the First Nation and Inuit Health website at [http://www.hc-sc.gc.ca/fnih-spni/substan/tobac-tabac/commun/index\\_e.html](http://www.hc-sc.gc.ca/fnih-spni/substan/tobac-tabac/commun/index_e.html);
- Be aware of tobacco fact websites and current strategies being used across Canada to address tobacco addiction, policies and cessation programs. For instance, <http://www.tobaccofacts.org>, <http://www.tobaccowise.com>, <http://www.canadian-health-network.ca/>;
- Challenge First Nation staff and leadership to set an example for the community;
- Eliminate the sponsorship of events or programs by tobacco companies or their associates;
- Sponsor in-house cessation programs that provide support to staff and community members to reduce and eliminate the use of tobacco products;
- Promote and protect the sacred use of tobacco through ceremony, poster and awareness campaigns;
- Provide up to date information about the health effects of commercial tobacco products;
- Create education campaigns for young children with the intent of reducing the incidence of tobacco use in adolescence and adulthood;
- Create and support cessation programs aimed at adolescents, which include components to address peer pressure, role modeling and addictive behaviours;
- Complete community research that identifies tobacco use by youth and families. Gather information about children's perceptions, the purpose of tobacco use (traditional vs. recreational), suggestions for cessation programs, stress factors and any other factors that contribute to the use and possible cessation of tobacco use by community members;
- Lobby government for stricter regulations on the chemicals used in tobacco products and more accountability of manufacturers regarding advertisements promoting smoking;
- Lobby the First Nation leadership for the development of policies and procedures to regulate and limit the number of tobacco-based businesses in your community;
- Develop and promote policies and guidelines at the First Nation level that ban smoking in public places;
- Monitor and regulate tobacco usage in the community through the selling of tobacco products;
- Pursue partnerships with other First Nations addressing the issue;
- Support regional and national initiatives to address tobacco-related issues;
- Lobby native leadership to become engaged with other native and non-native agencies striving to address this issue;
- Clearly define and promote the differences between traditional and non-traditional use of tobacco. Ensure that traditional use of tobacco is promoted and protected from misuse or abuse.

## Pesticide and Herbicide Use

Individuals are exposed to pesticides and herbicides through direct and indirect exposure. Direct exposure occurs when individuals are within the immediate area of use such as farmers, professional applicators and residential users. Indirect exposure occurs when individuals live close to areas where pesticides are used to manage vegetation or pests such as managed forests,

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agricultural areas and parks. Indirect exposure also occurs when pesticides or herbicides enter the air, water, soil and wildlife through air currents during spraying, run-off from agriculture and forestry as well as consumption of contaminated vegetation and water by wildlife or domesticated animals. Ed Desson (2007) with the Anishinabek Ontario Fisheries Resource Centre stated that a recent study showed high levels of toxaphene in fish in the Lake Nipigon area. It is believed that the toxaphene is coming from Mexico on the jet stream.

Some pesticides and herbicides have been linked to health effects such as cancer, respiratory disease, birth defects, adverse impacts on brain development, and reproductive problems (Ontario College of Family Physicians- OCFP, 2004). Some of the older pesticides that are either banned or severely restricted are “persistent organic pollutants” which means that they do not break down over time. For example, dichloro-diphenyl-trichloroethane (DDT) was banned in most countries in the 1960’s and yet traces of this pesticide continue to be found in people, including in children born long after it was banned (Environmental Defence, 2006).

The Canadian government through the Pest Management Regulatory Agency (PMRA) regulates the approval and use of all pesticides, including fungicide, herbicides, insecticide and antimicrobials within Canadian borders. Provincial governments are responsible for licensing, transportation, permits, spills and accidents as well as compliance and enforcement of their regulations. Many municipalities also have the power to pass by-laws regulating pesticide and herbicide use.

Pesticide manufacturers are required to provide data to the PMRA that demonstrates that their product is of “acceptable risk” and also effective at controlling the target pest. It is important to note the pesticides and herbicides are never deemed “safe”. Rather, regulatory evaluations determine “acceptable risk” and the intention remains for these products to kill a living being. The PMRA applies uncertainty factors during evaluation of scientific evidence about product risks. These uncertainty factors are applied in an attempt to take into consideration the differences between animals and humans as well as adults and children (Pest Management Regulatory Agency, 2007).

Children can be exposed to pesticides and herbicides through:

- inhalation of air pollutants and ingestion of pesticides that can contaminate house dust;
- skin contact with pesticides and herbicides used in homes and recreational areas;
- ingestion of pesticide residues on foods such as fruits, vegetables, meat, dairy products and processed foods.

The health concerns for children linked to pesticide use include poisoning (through accidental consumption or contact), thyroid problems, hormone disruption, cancer and developmental and intellectual defects (OCFP, 2004). The impact can be due to exposure during sensitive developmental stages during pregnancy, in early childhood or other windows of vulnerability. The impact of low-level exposure over the rest of a person’s lifetime is poorly researched.

## **Impact on First Nation Children**

The effects of pesticides and herbicides on First Nation children are similar to their effects on the general population. A few noticeable differences are the reliance of First Nation people on a more traditional diet of wild meats and the use of traditional medicines. In regions where vast areas are sprayed for forestry operations or agriculture, wild animals may consume contaminated plants and water. These animals accumulate the chemicals within their bodies and First Nations consume these animals (Ship, 1997). Traditional medicines are being harmed through the use of herbicides and fungicides aimed at reducing the growth of unwanted weeds, shrubs and brush. When traditional medicines such as yarrow and sumac are used, the chemicals are ingested, absorbed, or inhaled. It is not clear how many of these chemicals enter the human system through these avenues but similar exposures through the food chain have demonstrated the health effects of low-dose consumption of pesticides.

# Strategies

## Service Providers

- Reduce or eliminate the use of chemical pesticides and herbicides in your workplace. Lobby employers to use natural alternatives;
- If using pesticides or herbicides ensure products retain their original label, that label instructions are carefully followed, and the areas of use are well ventilated and cleaned afterward;
- Promote the use of organic fruits and vegetables, dairy and meat products by providing information regarding local growers or farmers that meet organic requirements. Serve organic food at community functions and meetings with posters displaying the organic choice;
- Promote the use of organic community gardens including staff participation through volunteering, financial sponsorship or advertising;
- Keep up to date information on the pesticide and herbicide use of local farmers and forestry companies available for clients. Research the health effects of these particular pesticides and herbicides. Provide the information to your local health staff to ensure that health effects linked to their use are properly diagnosed and monitored;
- Develop community research models that track health effects that are linked to pesticide and herbicide use, especially for communities that are located near forestry operations, agricultural areas and recreational areas such as golf courses;
- Lobby all government levels to take a no tolerance approach to pesticide and herbicide use. This means stricter research requirements for companies showing zero health effects from their products including inert or inactive ingredients;
- Lobby all levels of government for bans on chemical pesticide and herbicide use in forestry, recreation and agricultural areas as well as household cosmetic use.

## Household Chemicals

The health of the mother before conception is important to the health of her children. Individuals come into contact with a never-ending stream of environmental contaminants on a daily basis. In fact, "by the time the average woman grabs her morning coffee; she has spritzed, sprayed and lathered with 126 different chemicals in nine different products" (Environmental Defence, 2006). Chemicals are found in everything from clothes, furniture, dishes, food packaging and household cleaners. Many families are unaware of the toxicants that can be found in plastics, building supplies, home decorating products, children's toys, and even personal hygiene products. Some of the most recent concerns are the use of bisphenol A (hormone disruptor) in plastics and to coat metal food containers, brominated flame retardants used in many consumer products such as electronics, furniture and drapery fabrics, phthalates used to soften plastics, volatile organic compounds (used in paints, air fresheners and fragrances), and perfluorinated chemicals (used in stain repellants and non-stick surfaces) (Environmental Defence, 2006).

Health Canada is responsible for administering the *Food and Drugs Act*, *Hazardous Products Act*, *Pest Control Products Act*, *Tobacco Act* as well as co-administering with Environment Canada the *Canadian Environmental Protection Act*. Across these many laws, the federal government has legal tools to control toxic substances in consumer products. However, only limited controls are actually in place for well-known hazards including tobacco, pesticides and consumer products that contain high hazard substances or that are packaged in hazardous containers, or both (Canadian Environmental Law Association - CELA, 2008). There are significant gaps in the regulation of consumer products in terms of the use of toxic substances. In some cases manufacturers did not anticipate or intend that low levels of chemicals would be released from their products. Or, many common products contain chemicals of moderate or uncertain toxicity at low exposure levels and both the substances and the products have received little to no regulatory attention.

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The same chemicals used in a workplace are required, under the Hazardous Products Act, to provide a full display of ingredients and safety information yet those chemicals used in homes do not have the same requirements. There are concerns regarding the level of exposure children are experiencing since many common household products, such as household cleaners, can leave a residue on surfaces, impact on indoor air quality or lead to chemicals building up in house dust simply as a result of normal product use (Environmental Defence, 2006; Canadian Environmental Law Association and Pollution Probe, 2004). There has been research conducted showing mild health impacts including respiratory illness, vision problems, and skin rashes in children exposed to low doses of household chemicals in household cleaners. The health effects due to long-term or delayed exposure to some chemicals in common household products can include cancer, reproductive problems and birth defects.

## Impact on First Nation Children

First Nation children are more likely to live in substandard, low-income housing. Low-income housing is typically located close to highways, industrial facilities and hazardous waste sites where air contaminants are concentrated. Low-income housing tends to contain higher levels of contaminants such as lead from paint (in homes built prior to 1976), pesticides and fungicides to control pests and mould and PBDEs in dust from wear and tear on mattresses and other furniture particularly if it is old and in poor condition (TPH, 2005, Environmental Defence, 2006).

- 1 in 4 children in First Nation communities live in poverty;
- 40% of off-reserve First Nation children live in poverty (Campaign 2000, 2008);
- 46% of off-reserve children live in lone-parent families (Campaign 2000, 2008);
- 28% of the Métis population are considered low-income (Canadian Institute of Health Information, 2001).

## Strategies

### Service Providers

- Advocate for organic environmentally friendly household products;
- Advocate for the proper storage, use and disposal of household products;
- Conduct educational workshops for parents regarding household chemicals and safe alternatives. This includes proper rinsing and cleaning of areas where chemicals are used and inexpensive alternatives to common chemicals including vinegar, baking soda, salt, lemon juice and so forth;
- Advocate for safe use of products in community areas including schools, daycares, and health centers. Minimize the use of chemicals that are known to trigger reactions in people with sensitivities including air fresheners, deodorizers and disinfectants;
- Implement a medication and mercury thermometer collection and disposal program through a hazardous waste facility, the health centre or local pharmacy;
- Lobby government for support for the development of waste programs including medication disposal, hazardous waste, recycling and air quality programs;
- Lobby government for stricter regulations regarding the approval, labelling, and monitoring of chemicals used in household chemicals, cosmetics and consumer products.





*Aki*



*Earth*  
**Earth**



## Earth

After the great flood, Waynaboozhoo (Original Man) and a number of animals worked together to rebuild the Earth. Each animal and Waynaboozhoo tried to swim to the bottom of the water from the flood to collect a piece of Earth. After many failed attempts, the muskrat sacrificed its life to collect the piece of Earth. The Earth was formed when:

*“Waynaboozhoo took the piece of Earth from the muskrat’s paw. At that moment, Mi-zhee-kay (the turtle) swam forward and said, “Use my back to bear the weight of this piece of Earth. With the help of the Creator, we can make a new Earth.” Waynaboozhoo put the piece of Earth on the turtle’s back. All of a sudden the noo-di-noon’ (winds) began to blow. The wind blew from each of the Four Directions. The tiny piece of Earth on the turtle’s back began to grow. Larger and larger it became, until it formed a mi-ni-si (island) in the water. Still the Earth grew but still the turtle bore its weight on his back. Waynaboozhoo began to sing a song. All the animals began to dance in a circle on the growing island. As he sang, they danced in an ever-widening circle. Finally, the winds ceased to blow and the waters became still. A huge island sat in the middle of the great water.”*

~Eddie Benton-Banai, 1988

First Nation people were given the teachings of the land to show respect for all beings and to know the importance of all beings. When the world was overcome with fighting and evil, the Creator flooded the land to wipe away the evil and begin again. Today, First Nation people recognize that the Earth is again being damaged by the actions of people. Working internationally, Elders from all over the world are sharing their wisdom of the land and the teachings to educate the youth and governments on the importance of the Earth.

First Nation communities are being impacted by environmental hazards found in their food sources, contaminants in the soil resulting from ineffective waste management and contaminants found in community housing. The following information covers the environmental hazards, the impact on First Nation health and strategies to address each of these areas.



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## Food Source Contamination

*"Foods from the land and waters once provided everything native people needed. Food was a way of connecting to the land, with family and friends, in social situations, and with our culture. Food is a source of pleasure, nourishment and part of our cultural celebrations." (Ontario Federation of Indian Friendship Centres, 2002)*

First Nation people have a relationship to the land that is both spiritual and practical. Many First Nation families rely on traditional hunting, fishing and harvesting for their food. As industry and development expand and their pollutants contaminate soil and water sources, First Nation people are losing viable land which diminishes land use for their traditional practices. Along with the loss of their traditional food, they also lose a connection to the land and the physical benefits of their hunting, fishing and harvesting practices.

Not only is wildlife suffering from contamination, so are domestic animals and vegetation. In order to grow larger quantities of food and supply a larger population, modern agriculture includes the use of antibiotics with livestock, pesticides, herbicides and genetic modification in plant crops.

Health Canada is responsible for the monitoring and approval of chemicals, additives and drugs used in the food production industry as well as imported foods. The intent of maximum levels or limits of exposure to additives and chemicals is to protect the health and well being of Canadians while maintaining the viability of the food production industry. Maximum levels are based on scientific data for the chemicals or additives as well as daily consumption of the average person. A safety factor is worked into the maximum levels to account for differences in animal and human physiology. The Total Diet studies conducted by Health Canada are used to estimate the daily intake of contaminants based on daily consumption of average food.

Contaminants in food sources will vary depending on food types. In general, higher levels of contaminants will occur in processed foods compared to fresh. The highest levels of persistent organic pollutants such as PBDEs, as well as those that have been banned for many years such as PCBs or DDT, are found in animal products especially those high in fat such as some meats, some fish and high-fat dairy products like cheeses. The Canadian Food Inspection Agency monitors and reports on levels of pesticides, other agricultural chemicals, veterinary drugs, environmental pollutants and other impurities in agri-food commodities of both animal and plant origin (Canadian Food Inspection Agency - CFIA, 2006).

The agricultural sector uses pesticides, insecticides, herbicides and fertilizers to control weeds and sustain crop growth. Contamination of soil and water occur when agricultural chemicals run-off into water supplies, are distributed through air currents or when contaminated soil is mixed with water or other local soil.

Dairy and meat farmers rely on the use of antibiotics and chemicals to protect their animals from illness. Exposure to other chemicals and toxicants through pesticides and herbicides used on crops or in the water supply can cause contamination of the animals and their by-products.

## Wildlife and Natural Vegetation

Five herbicides are commonly used in the forestry industry in Ontario with 2, 4-D and glyphosate (aerial spraying) used in the most volume. Glyphosate is most commonly used as a broad spectrum herbicide that kills grasses, weeds and woody plants. It binds to soil and does not migrate into groundwater sources. In water, it settles into the sediment. Studies reviewing impacts to insects, fish, birds, amphibians and wildlife show results ranging from little toxicity to toxic impacts. There have been links to cancer, genetic changes and reproductive problems particularly sperm quality and adverse birth outcomes. The individuals considered at greatest risk are professional applicators, farmers and individuals impacted by spills. There is particular concern regarding the impact on the habitat of wildlife, insects and birds (Sang, 2006).

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Herbicides and pesticides are used in the forestry industry to control unwanted vegetation and insects that can impact the growth of the prime forest products (Sang, 2006). There are intended and unintended impacts of the use of herbicides and pesticides. Intended impacts are the selective deaths of competing vegetation and pests. The unintended impacts are the effects on wildlife such as bees and the contamination of surrounding soil and water. Wildlife can become contaminated when the chemicals are absorbed into the plant life or water or they can abandon the area (habitat) due to a loss of a food supply (Sang, 2006).

Additional contaminants are introduced into the environment from industry including mining, smelting operations, paper mills and construction. Contaminants common with these operations include heavy metals, volatile organic compounds, dioxins, furans and particulate matter (Environmental Defence, 2006).

*"Along time ago, Abel Kitchen invited me to go fishing up north. He invited me to go fishing. They had warnings out that they we getting mercury that came from James Bay when the water level was raised. The mercury came from the forest and went into the streams and rivers. The mercury got into the fish. But I didn't care at that time. I caught 3 walleye and we cooked it up right away. But we didn't talk about contamination. Now, we better worry."*

~Elder Jake Swamp, 2008

## Impact on First Nation Children

*"We have to learn how to be thankful. Remember all the stories that the grandfathers and grandmothers use to tell about their excitement of their hunt, excitement about their fishing. And how they could relate to the animals, to the earth and to the rhythm. When you are close to that you can almost talk to them and almost hear them respond. When you understand the nature, it is a different level of understanding and very sacred."*

~Elder Jake Swamp, 2008

The traditional diet most commonly consumed by Ontario First Nation individuals includes: freshwater fish, wild berries, home grown vegetables and wild game. 23.1 % of EAGLE project participants reported an increase in traditional diet consumption, 65.4 % reported that their diet has remained the same and 11.5% reported a decrease in traditional diet consumption (Assembly of First Nations, 2001). First Nations in rural locations rely more on traditional diets than First Nation individuals who reside in urban centers.

*"It takes 5,000 years for biochemistry to change. We have only had contact for 500 years." Loss of traditional practices, including loss of traditional diets, can be linked to the increase in dietary related disease and obesity.*

~Elder Rebecca Martell, 2008

The work of Dr. Otto Schaefer has demonstrated that the acculturation of First Nation people, specifically the loss of traditional practices, has negatively impacted their overall health and well-being. Prior to contact, First Nation people were well adapted to their environment and were able to address epidemics and nutritional deficiencies. This can be demonstrated through their long life expectancy and lack of disease. Since contact, the loss of their nomadic, traditional lifestyles has placed them at increased risk of food related diseases, epidemics and social disorder.

~Information provided by Elder Rebecca Martell, 2008

The move away from traditional food can be linked directly to loss of cultural identity and the natural transmission of traditional knowledge. Recommendations from interviewees and research regarding First Nation health demonstrates that the negative health impacts for First Nations associated with diet can be linked to the loss of access to traditional foods and medicine. To address and reverse the negative health impacts such as diabetes and heart disease, there needs to be a return to a traditional diet. This requires a shift in consumption of processed foods by individuals but also in environmental policies that directly impact habitat of traditional food sources and the contaminant burdens in soil, water and air quality (Smylie, 2001 & Ship, 1997; Arquette et al, 2002).

Due to the impact on habitat and concerns regarding contamination of traditional food sources, First Nation people have been replacing their traditional diets with processed foods, known to have higher contaminant loads than fresh foods, and that are readily available in grocery stores. Traditional meats such as moose, deer, fish and small mammals are being replaced with domestic meat such as chicken, beef, pork and farmed fish. There is also increased reliance on packaged foods that may include chemical preservatives as well as chemicals to enhance the taste, colour and texture of the food. First Nation people residing in urban centers are farther away from their traditional food sources and rely more on grocery store foods. Economic factors increase the likelihood of replacing healthy food choices with cheaper food alternatives such as processed meals (Ship, 1997).

*"If there are contaminated food warnings, you should have an independent study. If the warnings come from the government, sometimes the government does that to get our lifestyles to change. They want to assimilate our people and have tried many different ways. A lot of our people in the North depend on the wildlife and fish and if they tell them you can't eat that, it will make them sick, pretty soon they start to believe it. And maybe it is good that they do, but they better make sure that it is really contaminated and not just people trying to get people to do what they are suppose to do."*

~Elder Jake Swamp, 2008

The impact of this shift in diet can be seen in the increase of diabetes, obesity and heart disease. It is believed that diabetes in the First Nation community was extremely rare prior to the 1950's (Smylie, 2001).

- Type 2 diabetes is 3 to 5 times higher among First Nations people (First Nation and Inuit Health, 2008);
- 6% of the Métis population reported suffering from diabetes (Statistics Canada, 2008);
- Heart Attack rates among First Nations are 20% higher than the Canadian rates (Health Canada, 2008);
- 12 % of the Métis population reported heart problems and 14.7% reported problems with high blood pressure (Statistics Canada, 2008);
- 24.7% of the off-reserve First Nation population are obese compared to 14% of the non-native population (Statistics Canada, 2002);
- 23% of the Métis population are obese (Canadian Institute of Health Information, 2001).

## Strategies

### Service Providers

- Involve Elders in education programs to teach community members about traditional diets including hunting, fishing, harvesting and preserving of wild meats, vegetables and plants;
- Advocate for ongoing research to monitor contaminant levels including heavy metals, pesticides and contaminants identified as being of concern in local wildlife;
- Advocate for further research on local medicines and vegetation that are part of a traditional diet including berries and root vegetables (strawberries, sumac, sage, etc.) to determine if they are safe for consumption;
- Advocate for further research of breast milk to determine levels of contaminants being transferred to infants;
- Advocate for a traditional diet and a reduction of market foods high in salt, sugar, preservatives and higher in cost;
- Research and develop a community garden project that produces organic, local fruits and vegetables. Support an intergenerational approach involving youth and elders;
- Support the development of community co-operatives, grocery stores and farmer markets to supply a healthier and more affordable selection of traditional foods;
- Develop community kitchen programs to demonstrate healthy food preparation including how to shop and recipe exchanges. Include all age categories in the programs;

- Create a community food campaign (Good Food Box) where a membership of community members pool their money to negotiate the bulk purchase of nutritious foods such as fruits and vegetables;
- Investigate community greenhouse projects for northern climates to increase the ability to grow vegetables locally;
- Create a community education campaign including a communication plan for consumption guidelines and recalls of contaminated food products;
- Advocate for the initiation of a longitudinal study that monitors community members contaminants levels;
- Develop wild meat and medicine food banks that encourage community hunters, fisherman and traditional harvesters to share a portion of their harvest with fellow community members such as elders, low income and large families;
- Lobby government for research reviewing the environmental impacts of pesticide and herbicide use and safe consumption and exposure levels for contaminants;
- Lobby government for resources to develop and implement education programs to revitalize traditional food practices such as hunting, fishing and harvesting and to support healthy food programs long-term.

## Soil Contamination

Soil contamination can occur from naturally occurring substances such as heavy metal deposits and natural gases such as radon. The existence of these substances can pose problems when they affect air quality or contaminate ground or surface water. Much larger soil contamination problems arise from the introduction of foreign contaminants into the environment by industry, individual households and agriculture (Environment Canada, 2008). Soil contamination can occur from steel and petroleum production, pulp and paper mills, human sewage and waste products (to be discussed later in this section) as well as agricultural/forestry contaminants such as pesticides, herbicides and fungicides.

Unfortunately, contaminated soil can be very difficult or in some cases impossible to clean up. A number of methods used to clean contaminated areas include deactivation, remediation, and neutralization. Deactivation occurs when a material is added to the soil to bind with the contaminant making it inactive such as activated carbon (Illinois Pesticide Review, 2008). Remediation is the introduction of microorganisms into the soil that break down the contaminants (Government of Canada, 2008). Neutralization occurs when a material (usually another chemical) is added to the soil to make the chemical inactive such as lime added to sulphur. The cost associated with cleaning up contaminated soil can be quite expensive for communities and companies, especially when a spill occurs (aboutRemediation.com, 2008).

Additional information regarding the impact of soil contamination on health including contamination of soil from waste management, air contamination such as pesticides and the impact of soil contamination on water systems are discussed in further detail throughout this manual.

## Impact on Children's Health

Children are exposed to contaminants through multiple sources, including water, food, air and soil. Where soil is contaminated, children are at particular risk because they are often in direct contact with it and they will ingest soil and the contaminants it contains during normal activities, especially hand-to-mouth behaviour. The same risk exists from a child's normal activity on floors indoors since contaminants in soil can be readily tracked indoors. This is of particular concern for small children who are still crawling or toddling. Children are unlikely to be aware of contaminants in their backyards, local neighbourhood or the many places where they may play with friends.

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## Impact on First Nation Children

Laurie Hing Man Chan (2006) identified First Nation communities that were located within 50 km of chemical release hotspots (industry with significant release). Her work identified 135 to 176 communities within 50 km of heavy metal releases and 212 communities located within 50 km of dioxin and furan releases.

Some communities that are listed by the Federal government as being areas of priority for clean-up include:

- A former nursing station at Weagamow Lake is contaminated with petroleum hydrocarbons. It will be undergoing a clean up under the Contaminated Sites Accelerated Action Plan;
- Soil near two former nursing stations at Lansdowne House and Kasabonika Lake is contaminated by diesel fuel oil. It will be undergoing a clean up under the Contaminated Sites Accelerated Action Plan;
- Walpole Island First Nation is located on Lake St. Clair, which connects Lake Huron to Lake Erie. There is concern regarding the contamination of sediment around Walpole Island. Studies have shown the presence of persistent toxic chemicals such as hexachlorobenzene (HCB) and octachlorostyrene (OCS) which are believed to cause cancer (Jacobs, 2008);
- Cutler Acid Site located in Serpent River First Nation has been recognized as a priority site. Serpent River First Nation has been fighting for the clean-up of sulphur and heavy metals from the contaminated land.

## Strategies

### Service Providers

- Know where contaminated sites are located and what contaminants are known or suspected in your community. Post this information and make it available to community members;
- Lobby all levels of government to have these sites cleaned up or at least barricaded to minimize exposure;
- Support any action including legal action by your local government to have industry take responsibility for the clean-up of contaminated areas;
- Lobby government for stricter environmental assessments to be completed prior to any project to ensure that the chemicals or their by-products will not contaminate the soil;
- Store and dispose of all waste in a responsible manner to ensure it does not contaminate soil within the community;
- Lobby for strict regulations on waste disposal for the community to ensure proper engineering of waste disposal sites;
- Conduct community research to record health effects associated with soil contamination;
- Educate community members, particularly parents, about soil contamination in and near the "drip line" around any homes, including porches, built before 1976, that will likely contain high levels of lead from the application, upkeep and wear and tear of old lead-bearing paint. Children should not play, or help with gardening tasks, in this soil. Planting hardy, low-maintenance perennials and shrubs will stabilize this soil.

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## Waste Management

*“Waste management is the collection, transport, processing, recycling, or disposal of solid, liquid, and gaseous wastes in ways that reduce their effect on human health and the environment.”*

(Environment Canada, 2008)

Waste management has been identified as an area of concern for many urban and rural areas across Ontario. Urban centers are seeing an increase in waste and a reduction in available land for the disposal and management of waste products. Rural areas are seeing an increase in illegal dumping of waste products from residential and commercial sources as well as increased demands on their land resources for the import of waste products from urban centers (Walpole Island Heritage Centre and Chreod Ltd., 2007; Canadian Institute for Environmental Law and Policy, 2007). First Nation communities are witnessing increased incidences of illegal dumping by non-community members, a lack of resources for the development of efficient and effective waste disposal as well as encroachment on traditional territories by outside waste producers.

Two specific areas of concern regarding waste management are the management of solid waste including hazardous waste and the management of human wastewater (sewage). Both of these areas significantly increase the likelihood of soil contamination either through mismanagement or through problems with the systems themselves. For instance, dumping fees and limited hours that result from a lack of resources for management contribute to the increase of illegal dumping of residential and commercial waste. Inefficiently engineered waste systems pose harm to the environment and health by not properly protecting the soil from contamination (Walpole Island Heritage Center and Chreod Ltd., 1997).

*While on a canoe trip around Manitoulin Island, we stopped in a small area between some cottages. I took a small walk during our lunch break. Not far from the cottages, I saw a bunch of garbage. Not just bags but other junk as well. There was brown water coming from the garbage and it was going into the lake. These cottagers come to visit but they do not care for the island. They show no concern for the garbage that they leave behind.*

~ Paraphrase from Elder Gordon Waindubence, 2008

## Wastewater (Sewage) Management

Although wastewater is briefly discussed under the water section, it is important in a discussion of the Earth element since improperly managed raw sewage can impact the soil quality. An area of concern is the management of individual septic systems. Bill Rideout (2007) stated that many septic systems are not maintained properly and can be stressed by overuse or improper use by the household. This can cause the septic system to malfunction and leak raw sewage into the ground and in some cases, raw sewage can make its way to the surface where individuals can come into contact with it. Septic systems are required to be inspected at installation but there are no provincial requirements regarding maintenance of the systems. If the system is not built to address excessive household waste that can occur with overcrowding, then the system will malfunction and pose significant harm to the environment and human health (Ministry of Indian Affairs and Northern Development, 2006).

Inadequate community wastewater treatment facilities can also pose harm to human health and the environment. If the wastewater treatment is not built to the requirements of the community or is not adequate for the climate, untreated wastewater can be released into the environment, specifically into water systems. In communities where lagoon systems are used, there is the potential that cold weather, flooding and overuse can cause the release of untreated wastewater due to overload.

Kashechewan First Nation in Northern Ontario has been dealing with the health affects associated with raw sewage being released in their drinking water. The water treatment facility is located downstream from a local community's sewage lagoon which is inefficient in treating the raw sewage. In many cases raw sewage has been released into Porcupine Lake causing high levels of E. coli in the water. The community was evacuated in 2005 due to wide spread illness including skin infections. Efforts are still being made to address the community's concern on a long-term basis.

For additional information:

<http://cgi.bowesonline.com/pedro.php?id=31&x=story&xid=227889>;

<http://www.wawatay.on.ca/index.php?module=pagesetter&func=viewpub&tid=1&pid=131>

## Impact on First Nation Children

A 2003 report completed by Indian and Northern Affairs Canada (INAC), reported that 16% of wastewater systems on reserve were classified as high risk, 44% were of medium risk and 40% of low or no risk of impacting wastewater effluent. The problems identified with these systems are similar to the problems associated with water treatment facilities including the lack of adequate resources, lack of training, inadequate facilities including system development.

The Report of the Expert Panel on Safe Drinking Water for First Nations (2006) stated that individual septic systems are not regulated to the same extent as provincial systems and can pose harm to human health. Although the report speaks specifically to the effects of wastewater systems on water quality, the septic system section recognizes that reserves are not regulated to the same safety standards as the general population so systems are often improperly built and maintained.

If wastewater systems including septic systems release untreated sewage into the environment, children can come into contact with the waste through exposure to contaminated water or soil. Human waste can introduce microbiological pathogens into the human body. One particular biological concern is the introduction and spread of Cryptosporidium, which causes diarrhea and can be spread through contact with contaminated soil, water or food (Division of Parasitic Disease, 2008). Other biological pathogens can affect the digestive system and can be spread through contact with fecal matter. To stop the spread of these pathogens it is necessary to reduce contact with contaminated water, soil and food and to clean hands and food properly before consumption. Children are at risk of contamination since they "mouth" objects and have more hand to mouth contact with food and soil.

## Strategies

### Service Providers

- Lobby government for regulations for septic system design, installation and maintenance;
- Have a communication policy in place to report sewage contamination including water, swimming advisories and health impact reports;
- Have policies in place to address the spread of infections associated with exposure to fecal matter including fact sheets and infection control information;
- Lobby government for sufficient resources to address wastewater and septic concerns for your community including resources for the development and maintenance of effective treatment facilities and for environmental assessments;
- Refer to Water section for additional strategies.

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## Solid Waste Management

The federal government is responsible for the movement of waste between countries and between provinces. The provincial government is responsible for the movement of waste within the province as well as regulating generators and waste management facilities (Environment Canada, 2008). Waste management has been a problem for well over a decade and a number of attempts have been made to address the growing concern including the export of waste to the United States, the use of incinerators to burn waste and the development of remediation programs for hazardous waste. In 1991, the Ministry of the Environment banned the development of new incinerators for municipal solid waste. In 1995, that ban was lifted but the debate regarding the safety and impacts of incinerators on human health and the environment has continued (Canadian Institute for Environmental Law and Policy, 2007). There has been increased focus on the need to reduce, reuse and recycle.

- In 2005, Ontario's municipalities and industrial, commercial & institutional (IC&I) sector produced approximately 13.3 million tonnes of waste, of which about 3.3 million tonnes were diverted through the province's 3Rs program, 6 million tonnes were landfilled or incinerated within Ontario and 4 million tonnes were exported to the United States for landfilling or incineration (Carter-Whitney, 2007).

### Reduce

Reducing the volume of waste produced by households and industry will decrease the need for landfill space and management systems to address excessive waste. There are a number of strategies for reduction including requiring manufacturers to produce longer-lasting, environmentally-sound products, reducing packaging for consumer products, reducing the use of non-renewable resources and being a smart consumer. Smart consumerism includes purchasing what is needed rather than just wanted, purchasing products that have multiple uses and avoiding hazardous materials that are difficult to dispose of in a safe manner.

### Reuse

Reusing products is the next step in diverting waste. Products can be reused, repaired or made into new products rather than throwing them away. The idea is to delay the product's introduction into the waste system.

### Recycle

Recycling is used to turn products back into raw materials that can be used in the production of new products. Recycling reduces the introduction of materials into landfills by diverting them back into industry. Industries can support each other by diverting by-products to an industry that needs them including reusing metals, glass and paper.

## Environmental Hazards of Solid Waste

The environmental hazards associated with solid waste include the leaching of liquid materials such as hazardous chemicals into soil surrounding landfill sites or disposal sites. Gases produced by decaying garbage and hazardous waste contaminate the air and reduce air quality (Bethune, 1997). While decaying, waste can undergo many chemical reactions that produce hazardous gases, liquids and other contaminants. These contaminants enter the environment and pose hazards to water, air, soil quality and wildlife.

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Hazardous waste includes household chemicals, large waste products such as appliances, medical waste and industrial waste such as heavy metals and sludge (Walpole Island Heritage Center and Chreod Ltd, 2007). Some hazardous waste can be treated through special processes that will deactivate, remediate or neutralize the waste. These treatments are expensive and time consuming.

## Impact on First Nation Children

Solid Waste management is not a current priority for First Nation communities, which results in incomplete waste management policies (Walpole Island Heritage Centre and Chreod Ltd, 2007). First Nations lack the resources to build and maintain safe, managed landfill sites; instead they rely on unmanaged, unsecured dumps. Many First Nations have problems with illegal dumping by non-community members and businesses. In fact, one First Nation believes that four-fifths of its waste comes from off-reserve. There is considerable concern for remote communities in addressing the disposal of hazardous waste, medical waste and large waste products like appliances and vehicles (Ron Plain, 2007; Walpole Island Heritage Centre and Chreod Ltd., 2007).

Due to inadequate waste management systems, First Nations are at risk of water, soil and air contamination from the dumps and backyard disposal of waste. Communities have to address problems with the backyard storage of hazardous waste including oil, paint and household chemicals as well as burning of trash by residents including plastics, construction materials and furniture (Bill Rideout, 2007; Walpole Island Heritage Centre and Chreod Ltd., 2007). Burning trash, especially plastic is extremely hazardous since burning plastics can create highly toxic dioxins, furans and other high-hazard chemicals that will be emitted directly to the local air. The ash will also be very hazardous.

As mentioned earlier in this section, children are at risk of harm from soil contamination and solid waste because of the number of contaminants that can be found in dumps and landfills. Dumps located on reserves may not be staffed or fenced, so children can have direct exposure to the waste by playing in the area or coming into contact with contaminated water or contaminated air and fly ash if garbage is burned. Leaching of chemicals into the water source can contaminate fish stocks. Contaminated soil affects plant life, which can be consumed by wildlife and community members. Wildlife can also enter the dump area and consume contaminated waste. Human consumption of these animals and plants pose a risk of contamination. Dioxins and furans created by the burning of waste are known to be associated with multiple health impacts including reproductive and developmental toxicity, respiratory toxicity and cancer.

## Strategies

### Service Providers

- Address community waste management by developing policies for waste disposal, hazardous waste and recycling;
- Discourage backyard burning of garbage;
- Seek funding and support for workshops to teach community members how to construct bear-proof garbage bins to respond to concerns that garbage is burned to discourage bears and other animals;
- Dispose of medical waste properly through hazardous waste sites or alternative disposal systems;
- Advocate for environmentally safe waste disposal systems;
- Support recycling programs by implementing organizational recycling programs;
- Eliminate the use of disposable items (coffee cups) within the organization;
- Reuse items when possible by participating in item exchange programs (baby clothes exchange);

- Develop education campaigns aimed at all community members to advocate for reduction, reuse and recycling;
- Know the health and environmental hazards posed by your community's waste disposal site and make this information available to community members;
- Provide a disposal program for unused medications;
- Develop an organization composting program for food waste created by the organization. Use the compost in community garden programs;
- Pursue funding for the creation of a year-round recycling program in your community. Conduct educational campaigns to encourage community participation
- Lobby government for the development and maintenance of waste management policies and programs.

## Housing

As mentioned in the Air section, chemicals found in the average household can pose health risks to children and their families. These risks are associated with chemicals used in household cleaners, personal care products, and many different chemicals in common consumer products such as PBDEs in furnishings or phthalates in vinyl shower curtains. Concerns also exist about chemicals used in building materials and problems created by building design and maintenance, particularly mould. An additional environmental risk associated with housing is the choice and operation of heating systems. For information on the environmental health impacts of heating sources, refer to the Fire section of this manual.

## Building Materials

Building materials, solvents and surface coatings used in both new construction and renovations can contain many different toxic chemicals. As a result, demolition and renovation activities can be extremely hazardous for pregnant women and young children. Chemicals of concern in building materials and incorporated into existing housing stock can include asbestos, lead, arsenic, poly vinyl chloride, formaldehyde and many different organic solvents.

Asbestos was widely used in building materials prior to 1980 and fire-resistant asbestos tiles are still often seen on the exterior of homes in the north. The fibres of asbestos are known to cause cancer but so long as asbestos tiles are undisturbed they can continue to help protect homes from fire in the fire-dominated bush of northern Ontario. Indoors in older homes asbestos may be present in ceiling tiles, old vinyl flooring, textured paints, and stove, furnace, and pipe wrapping or taping. Disturbing these materials is very hazardous. Until 1990, one type of asbestos continued to be combined with vermiculite to make insulation. There is no safe level of exposure to asbestos fibres and extreme care is necessary if asbestos-containing materials are damaged or disturbed.

Lead is almost certainly present in painted surfaces, including in layers underneath existing paint, in any buildings constructed prior to 1976. Lead levels will be especially high in homes built prior to 1960. Normal wear and tear on these surfaces, and especially renovation activities, can release very high levels of lead to indoor dust which can create a very serious hazard for young children. Pregnant women should also not be exposed to this dust. Pressure-treated wood purchased prior to January of 2004 will contain arsenic, another known carcinogen. If these outdoor surfaces are available to children, they should be treated with a penetrating sealant every couple of years. Care is necessary when sawing or sanding this wood to avoid contact with the sawdust. All old-painted wood, all pressure-treated wood, (both the older wood treated with arsenic or newer types of pesticide-treated wood), should not be burned as this releases dangerous chemicals to the air.

Poly vinyl chloride is used in many building materials such as siding and flooring and will release phthalates to the surrounding air especially if it is torn or if edges are exposed. Formaldehyde is a suspected carcinogen and the federal government considers

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it “toxic” as defined under the *Canadian Environmental Protection Act*. Though its use is gradually being phased out, it remains poorly regulated and it continues to be used in building and furniture materials.

Many different building, plumbing and electrical materials and coatings contain hazardous organic solvents. Some environmentally harmless alternatives exist and should be used but these chemicals are often necessary to ensure buildings meet plumbing and electrical standards. Because of the many risks associated with demolition and new construction or renovations, the Canadian Partnership for Children’s Health and Environment recommends that numerous precautions be taken to avoid exposures to children and pregnant women (CPCHE, 2008).

## Impact on First Nation Children

Housing continues to be an issue for First Nation communities. The 2006 census demonstrated that nearly one in four homes required major repairs with no difference since 1996. First Nation people were three times as likely as the general population to live in homes in need of major repairs (Statistics Canada, 2008). As of 2006, 24% of First Nations off-reserve had housing needs (Indian and Northern Affairs Canada, 2008). In 2006-2007, the federal government dedicated a one time investment of \$48.4 million dollars over three years to address off-reserve housing needs for First Nation people (Government of Canada, 2005).

Poor housing designs and the use of low-cost materials means many homes located in First Nation communities contain a number of the chemicals discussed within this section. As communities take over control of housing, they are identifying their housing concerns including environmental impacts and developing strategies to address these concerns. Indian and Northern Affairs Canada (INAC) conducted a review of on-reserve housing to determine the use of vermiculate insulation containing asbestos particularly the brand name Zonolite, which was known to contain asbestos. The review did not find any houses on-reserve containing Zonolite. (Note: The review was limited and can not account for all houses on reserve.)

The Mohawks of the Bay of Quinte have developed a successful housing initiative that builds energy efficient homes. Their housing program includes rental and mortgaged homes, training programs for community members in energy efficient building as well as housing for the elderly and disabled. The training initiatives allow the community to use new energy efficient home building technology to supply their community with a high standard of housing. For additional information, contact the Mohawks of the Bay of Quinte at [www.mbq-tmt.org](http://www.mbq-tmt.org) or 613-396-3424.

Due to a lack of infrastructure money, First Nation communities use older buildings to house community programs including day cares and health programs. The use of older buildings that contain toxic building materials can pose significant risks to children and community members especially if the building is not maintained.

## Strategies

### Service Providers

- Provide information to the community about the hazards of building supplies and household contaminants;
- Avoid the use of chemically treated or toxic building materials in community buildings and outdoor structures including play areas, fencing, gardens, etc;
- Provide information about funding options for renovations and repairs as well as funds for new buildings;
- Advocate for the use of environmentally-friendly building materials within the community including any renovations to community buildings;
- Research alternative building methods including the use of local materials, recycled materials and alternative energy systems. Provide this information to community members as well as your local government;

- Lobby for industry changes to the use of toxicants in building materials;
- Advocate for funding for infrastructure including the replacement of older buildings;
- Advocate for a hazardous waste depot in your community for the disposal of household hazardous waste;
- Lobby government for the development and enforcement of stricter regulations for rental housing;
- Lobby government for the development and maintenance of training and building programs for the creation or renovation of buildings (housing and public) to be environmentally friendly.

## Mould

Mould is a fungus, in the same family as yeast and mushrooms. Mould build-up occurs when excess moisture is retained indoors. Mould tends to originate in areas prone to moisture such as bathrooms, kitchens, and basements but it can spread from these areas to the rest of the house. In homes with mould problems, it can be found in carpets, wallpaper, insulation, wood and drywall. More than 270 kinds of mould are found in Canadian homes (Toronto Public Health, 2008). Mould should be considered a symptom of a problem in the house so it is important to address the underlying moisture problems (Bill Rideout, 2007). Mould problems can be reduced by running water away from the house to prevent moisture problems in the basement, and by ensuring ventilation systems are installed and working properly in bathrooms and kitchens.

The health impacts of mould include respiratory illness, eye, nose and throat irritation as well as allergic reactions. Individuals with asthma will likely experience an increase in attacks. Vulnerable populations, including children, the elderly and individuals with suppressed immune systems, are at risk of negative health impacts (Toronto Public Health, 2008).

## Impact on First Nation Children

It is estimated that half of First Nation households contain mould. Communities across Canada have been addressing mould problems with training and inspection programs meant to identify and address community wide issues. Wikwemikong Unceded Reserve is one such community in Ontario. The community identified building practices as one area contributing to the mould problem. This included building design, poor ventilation and the use of basements and crawl spaces in a moist climate. By identifying these concerns the community has been able to build better homes that are energy efficient, properly ventilated and do not have basements or crawlspaces (Indian and Northern Affairs Canada, 2008).

First Nations families on and off reserve are more likely to reside in poorly maintained homes due to low incomes (Environmental Defence, 2006), which contributes to mould problems.

Fort Albany First Nation located in Northern Ontario has been struggling to address a community wide mould problem caused by poor housing conditions. Health Canada declared that the community needed extensive repairs to at least 26 homes. As of October 2007, Indian Affairs has yet to address the communities concerns. It is estimated that \$2.3 million is needed to repair the 26 homes (Canadian Press, 2008).

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## Strategies

### Service Providers

- Monitor mould related illnesses within the community;
- Provide information about mould health impacts and clean up information including contact information for laboratories to test for mould and professionals for clean-up;
- Provide information to community members for funding programs to help make repairs to their homes;
  - Canadian Mortgage and Housing Corporation- <http://www.cmhc-schl.gc.ca>
  - Indian and Northern Affairs Canada- <http://www.ainc-inac.gc.ca>
- Advocate for improvements to rental housing to address mould problems including proper clean up and repairs to units;
- Lobby government for resources (expertise and monetary) to address housing concerns on reserve, including resources to address chronic and widespread problems with mould.



*Shkode*



*fire*  
*fire*



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## Fire

Each of us has a fire that burns within. When that fire is low then our mental, emotional, spiritual and physical elements are also low. In order for our fire to burn strongly we have to feed it positive energy, healthy things. Toxins, much like water, put out our fire. When we become connected with our fire and cleanse our bodies, our fire grows stronger.

*Men are responsible for the fire. Their responsibility is to their families, children and the environment. When they can connect all that together, our world and environment become stronger. Their fire burns stronger.*

~ Ken Tabobondung, 2007

The Firekeeper says to Waynaboozhoo (Original Man);

*"You see, fire is a very special gift for the Creator. If you respect it and take care of it, it will take care of you and bring you warmth. But locked up in this goodness is also evil. If you neglect fire or use it in the wrong way, it could destroy the entire Creation. Many things in life have forces of good and evil locked up in them. Every time you use fire you should remember that this is the same fire with which the Creator made the Sun. It is also the fire that the Creator put at the heart of your Mother Earth. You can use this fire to communicate with the Creator. You can use it to burn Tobacco and let its smoke carry your prayers to Gitchie Manito."*

~Eddie Benton-Banai, 1988

## Heating Sources

Home heating systems vary according to the fuel used for the system. Whether wood, natural gas or oil, combustion heating systems emits common contaminants into the environment. Air pollutants such as carbon monoxide, carbon dioxide, trace levels of dioxins and furans as well as particulate matter, polycyclic aromatic hydrocarbons and volatile organic compounds are introduced into the environment from initial combustion through cooling. Proper installation and maintenance of heating systems can reduce production of these contaminants and limit exposure to any that are produced by properly venting hazardous gases out of the house and by filtering particulate matter from the air (Environment Canada, 2008).



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Negative health impacts associated with fossil fuel burning and wood heat include cancer and respiratory illness from the dioxins, carbon monoxide and particulate matter. Dioxins and furans are linked to liver problems, problems with the immune system, reproductive problems and birth defects. Polycyclic aromatic hydrocarbons (PAH) are associated with cancer, reproductive and respiratory problems (Health Canada, 2004). Children are particularly vulnerable to the contaminants contained in fossil fuel emissions.

## Wood Burning

Conventional wood burning stoves and fireplaces are only 10% efficient. Conventional designs do not allow the complete combustion of the wood. Some of the combustible compounds of the wood are released into the air through smoke. These compounds can be released up the chimney and cause creosote build-up and outdoor air pollution and some are released into the home, which contaminates the indoor air quality. Due to inefficient designs, wood burning stoves and fireplaces can release toxic gases such as carbon monoxide, into the home (Natural Resources Canada, 2008; Environment Canada, 2008).

Wood burning is becoming more common as a primary or secondary source of home heating. Inefficient wood burning releases particulate matter, carbon monoxide, volatile organic compounds and polycyclic aromatic hydrocarbons in the air. Health effects associated with these contaminants include respiratory and heart disorders, and cancer. Vulnerable populations such as children, the elderly and sick are at increased risk of harm from the contaminants created by wood burning. It is believed that 25% of airborne particulate matter, 15% of volatile organic compounds and 10% of the carbon monoxide in communities where wood is burned are caused by wood burning appliances (Natural Resources Canada, 2008). When many households burn wood in communities located in valley lands there can be serious localized air pollution when weather conditions create inversion layers trapping smoke beneath low-lying clouds. The use of diesel generators can further worsen air quality under these circumstances.

- Approximately 3 million homes in Canada use wood as a primary or secondary heating source.
- 4.7% of households use wood heat as a primary heat source (Statistics Canada, 2008)

## Oil Burning

Using oil for heating has many of the same environmental effects as gas and wood heating. Oil contains sulphur, nitrogen oxide, particulate matter and volatile organic compounds. The environmental concerns regarding oil heating are the same as the use of fuel in vehicles or the production of plastics. Oil is a petroleum product that has to be extracted from the earth, refined and shipped. All of these processes, including residential storage and use, pose hazards to the environment including air, soil and water pollution (Environment Canada, 2008). Oil is recommended by Environment Canada as a cleaner alternative to wood heating.

- 9.5% of households in Canada used oil or other liquid fuels as a primary heating source (Statistics Canada, 2008)

## Natural Gas Burning

Natural gas is considered the cleanest burning fuel source. It is used in household appliances and for home space and water heating as well as commercial and industrial applications. Although a cleaner heating source, natural gas still releases carbon dioxide, nitrogen oxide, particulate matter and volatile organic compounds. Many of these contaminants are released in much smaller quantities than other fossil fuels especially in high efficiency furnaces and water heaters (Environment Canada, 2008). As mentioned in the above sections, these contaminants affect the respiratory system, contribute to air pollution and have links to cancer.

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- 49.4% of households in Canada used natural gas as the primary source of heating (Statistics Canada, 2008)

## Impact on First Nation Children

First Nation communities are witnessing the impacts of air pollution on the environment including contamination of their water and food supplies. Far north communities have high levels of contaminants in their systems due to transfer of contaminants through the air currents and subsequent biomagnifications in the northern environment and food chain (Ship, 1997). The additional impacts of climate change and global warming are impacting their food sources.

Many First Nation communities particularly those in remote and rural areas rely on wood to heat their homes. It is a cost effective heating source and the materials are readily available. Communities that rely on diesel generators and fossil fuel burning for heat and energy are attempting to locate alternative sources of energy and heating to lower costs and minimize their environmental impact.

- Fort Severn First Nation utilizes a waste heat recovery system to heat their water treatment plant. The waste heat comes from the diesel generating engines from the community energy station. For additional information, contact Fort Severn First Nation at (807) 478-2572 or [www.fortsevernfirstnation.com](http://www.fortsevernfirstnation.com);
- Grassy Narrows First Nation utilizes sawmill waste products to fuel a community boiler that heats the school, day care centre, community hall and administration building. For additional information, contact Grassy Narrows First Nation at (807) 925-2201 or [http://ainc-inac.gc.ca/clc/tp/gras\\_e.html](http://ainc-inac.gc.ca/clc/tp/gras_e.html)

## Strategies

### Service Providers

- Improve the heating efficiency of the organization's buildings by checking for leaks around doors, windows, vents and the roof. Seal or replace all areas where heat leaks;
- Make information available to the community regarding safe burning of wood and fossil fuels including furnace cleaning and inspection, venting and how to properly work a woodstove and fire place to improve combustion;
- Support innovation in your community by supporting the research and development of alternative energy sources;
- Communicate with other communities regarding their alternative energy projects;
- Monitor air quality within the community during heating seasons including health effects associated with fossil fuel burning;
- Provide information on funding sources for upgrades to heating systems and household improvements;
- Lobby the government for resources to research and develop alternative heating and energy sources for housing and public buildings.

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## Emissions from Combustion

*We must each recognize our personal contributions to the abuse against Mother Earth. I am just as guilty of polluting the earth. I take planes to travel when I speak. How can I justify it? I travel to talk about what we can and should be doing to heal Mother Earth. But I can not walk to California, it would take weeks. Now, I mix trips so I am not just going for only one event.*

~ Elder Jake Swamp, 2008

Emissions to the air from combustion or burning arise from residential, transportation and industrial sources including coal-fired electric power plants. Most of this combustion is of fossil fuels including wood, oil, natural gas and coal but it can also include the smelting of ores and incineration of waste. The volume of pollutants released to air from these varied combustion sources is far greater than releases to water and soil underlining the need to dramatically reduce overall dependence on fossil fuels and greatly increase both energy efficiency and the development of renewable sources of energy.

### Industry

Industry is required to report their emission levels through the National Pollutant Release Inventory as well as a number of other reporting programs depending on the location and type of industry. Reporting of emission, including ensuring public access to this information, is often the first step towards reducing emission levels over time. Some of the reportable emissions include core industrial chemicals, toxic metals, polycyclic aromatic hydrocarbons, dioxins and furans and many additional air contaminants (Hing Man Chan, 2006).

The emissions from petroleum and petroleum product production, steel manufacturing, aluminum smelters, pulp and paper and energy production are known to negatively impact the environment (Hing Man Chan, 2006). Although communities located in close proximity to industrial sites are at increased risk of negative effects, all communities have some level of risk since contaminants travel through the water and air.

### Residential

As mentioned under the Home Heating section, residential heating systems produce emissions that negatively impact the environment and human health. Some heating systems such as natural gas and oil are considered cleaner alternatives to wood heat (Environment Canada, 2008). Although the emissions from the home heating system might be lower for natural gas and oil, there is concern regarding the effects on the environment from the extraction and processing of these fuel sources. Oil and natural gas require the extraction of the raw product from the ground, transportation across large geographic areas and processing of the product into a usable product (David Suzuki Foundation, 2008).

The contaminants from these products are discussed under the Home Heating section above.

The environmental residential emissions through home heating include the development of harmful greenhouse gases, air pollution and habitat destruction.

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## Transportation

Transportation accounts for 27% of Canada's greenhouse emissions (David Suzuki Foundation, 2008). Personal transportation makes up the largest contributor of emissions. Additional contributors, including the airline industry, freight transportation (trucks, trains, and ships), are also of concern. Although efforts have been made to address vehicle emissions, more efficient vehicles will not address the impacts of more vehicles on the road, more air travel and freight shipment. The increasing need for transportation continues to create higher levels of greenhouse gas emissions.

Alternative fuel systems (ex. hydrogen and bio fuel) are being developed to address emission concerns as well as reduced fuel sources but these systems are of concern since the production of the energy source still contributes to greenhouse emissions.

Transportation emissions release volatile organic compounds, nitrogen oxide, carbon monoxide, carbon dioxide and particulate matter. These contaminants are linked to cancer, respiratory illnesses, and cardiac problems. These contaminants also enter the soil and water via atmospheric fallout (Transport Canada, 2008).

## Impact on First Nation Children

Although access to alternative energy and transportation systems is improving, First Nation communities continue to use inefficient heating sources and fossil fuel transportation. Remote and rural communities rely on vehicles to transport individuals, food and products. As mentioned in other sections of this manual, First Nations are considered a vulnerable population when it comes to environmental impacts due to proximity to industry, substandard housing and cultural practices such as traditional food sources. The following are examples of communities affected by industrial and transportation emissions.

- Ketegaunseebee First Nation, (Ojibways of Garden River) is located close to 9 facilities required to report under the National Pollutant Release Inventory including forestry, pulp and paper, petrochemical and steel production. Community members expressed concerns regarding vehicle emissions as well as air pollutants. Impacts include concerns about food sources and traditional medicine (Commission of Environmental Cooperation, 2008).
- Aamjiwnaang First Nation is located within 10 miles of 54 facilities required to report under the National Pollutant Release Inventory. Body mapping of community members demonstrated health effects including reproductive disorders, developmental and learning disabilities, skin and respiratory disorders, thyroid, kidney problems and cancer. There is additional community concern regarding the effects on food sources, traditional medicines and the safety of conducting outdoor ceremonies (Commission of Environmental Cooperation, 2008).

Laurie Hing Man Chan (2006) conducted research that mapped exposure to pollutants among First Nation communities across Canada. Included in her research are maps that show the location of pollutant release facilities and First Nation communities located within 50 kilometres. Her research recorded up to 348 communities located within 50 kilometres of facilities that release contaminants like dioxins, furans, heavy metals, particulate matter, volatile organic compounds, carbon monoxide and sulphur dioxide. All of these contaminants have links to respiratory disorders, reproductive disorders, endocrine and hormone disruptors, neurotoxicants and carcinogens.

First Nation statistics are included under Air, Water and Earth that demonstrate the health impacts of the contaminants found in the emission discussed above.

# Strategies

## Service Providers

- Utilize the National Pollutant Release Inventory and other chemical reporting release lists to determine the contaminants in your area. Use the [www.pollutionwatch.org](http://www.pollutionwatch.org) website to track pollution by individual facility or across entire communities, or regions. Develop training strategies for organization staff, community members and local leadership;
- Utilize the information from the lists to develop research and monitoring of contaminants specific to your community including soil, water, air and food source contamination;
- Monitor health effects that can be linked to emissions;
- Lobby government for stricter regulations for the monitoring of contaminants and enforcement of these regulations;
- Advocate for stricter regulations to force industry to reduce emissions and eliminate the use of toxic substances;
- Provide information to the community regarding contaminants in local soil, water and air including health impacts;
- Support local industry for the production of food, clothes and household supplies;
- Lobby government to invest in energy efficiency and clean energy sources and phase out nuclear power;
- Develop programs to increase alternative transportation including walking, biking and carpooling (ex. community grocery bus for remote communities);
- Support community action against local industry to reduce emissions and clean-up contaminants.





*Nbrish*



*Water*  
*Water*



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## Water

*"Water is alive. It can hear and see. It is a gift to be cared for and it belongs to all of creation."*

~Elder Josephine Mandamin 2008

*"When I was growing up, water was abundant and precious. It would rain for days and we would collect as much as possible. My mother would burn tobacco in our woodstove as an offering to the thunder and lightning. We did not waste water because we had to work to get it. Fasting teaches us to appreciate the life giving force of water and food. The first sips and nibbles after a Fast demonstrate this by the power that floods the body as the water infuses it and the food nourishes it."*

~Elder Josephine Mandamin, 2008

First Nations people have a special relationship with Mother Earth. They are its caretakers and have been given the knowledge to ensure her health and well-being. In turn, Mother Earth provides for them. There is a connection between their bodies and Mother Earth. They know when they are ill and need healing but it also tells them when something is wrong with Mother Earth. They become sick from sick water, land or air that tells them that Mother Earth is sick. Just as they heal ourselves, they must heal her.

With love and respect the water can be healed. Working with science, First Nation people can protect the water for their children and the generations to come. Proof of the power of words, prayer, song and love in water are shown through the work of Marasa Emoto ([www.masaru-emoto.net](http://www.masaru-emoto.net)) who photographs the effect of contaminants on water.

*"Water is who we are as people and who we have always been. We have to learn to care for the water not only for ourselves but the seven generations."*

~Sister Priscilla Solomon, 2007

Women are caretakers of water. Just as men are responsible for fire, women are responsible for the protection of water, thereby for the health of their communities and children. "My commitment as Anishinabe-Kwe (native woman) to ensuring the sustainability for life for our future generations guides much of my life. Our 'Sacred Water' is the very essence of what will continue to sustain our life," (Mary Deleary, NationTalk, 2007).

This commitment to the protection of water is a sacred responsibility of First Nation women. Josephine Mandamin says; "in the language, we say "the flow has opened the coming"". It speaks to the interconnectedness of women and creation and how life arrives (Laura Liberty, 2008). The relationship between women and water begins with the creation and nurturing of a child within the womb. That child's entrance into the world begins with the breaking of the water much like Mother Earth brings new life with the coming of spring when the waters flow.

In 2003, a group of Anishinabe-que walked 1,200 kilometres around Lake Superior in the First Annual Women's Water Walk to promote the preservation of water and Mother Earth. Since 2003, the Mother Earth Water Walkers have walked around all the Great Lakes. The journey of these women began with a prophecy told by Grand Chief E. Benton-Banais-Bawdwayadun that stated, "In about 30 years, if we humans continue with our negligence, an ounce of drinking water will cost the same as an ounce of gold." Intending to only walk around Lake Superior, Josephine Mandamin (founder of the Mother Earth Water Walkers) and her fellow walkers were told by an elder, "that as a young child his grandfather always talked about a day that women would walk all of the Great Lakes" (Kalvin Perron, 2005). Believing they were those women, they have continued to walk the Great Lakes, to bring healing to all streams, waters, rivers, tributaries, and lakes that were encountered along the way as prayers and semaa (tobacco) were offered, also to raise awareness of the careless treatment of our most valuable resource (Laura Liberty, 2008).

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First Nation governments recognized the sacred responsibility of women to the protection of water by establishing Women's councils meant to advise on policies that affect water.

## Water Contamination

### Source of Water

*First Nations believe that there are four waters: the forever flowing waters that flow from the heavens who protect and cleanse our Mother, the Earth; the rivers and streams that are her life blood, the water that flows within the trees and provides us with medicine and the waters that flow within us that also nurture and protect our unborn.*

~Laurie McLeod-Shabogesis, 2008

Water protection begins at the source and ends in the household pipes. First and foremost water sources must be protected. This includes the lakes, rivers, streams and land in close proximity to well water. The steps thereafter are determined by the treatment process used. For private wells this can be a simple filtration system but in the case of water treatment facilities the water can undergo numerous steps before it proceeds to the distribution system and flow out the tap. Contaminants can enter the water at any point in the system. The following outlines where we get our water and how contaminants affect our water quality.

There are two sources of water used for human consumption. Surface water including rivers, lakes or any water that is on the surface of the earth. Surface water is supplied through rainfall or groundwater and in much of Ontario is contained in lakes or groundwater deposits that are a precious legacy from continental glaciation that, if depleted, could not be replaced by annual rainfall. These water sources are susceptible to pollution through a variety of sources including run-off from roadways, industrial sites, waste management sites (landfills/dumps), agriculture (farmlands) and fallout from air pollution.

Groundwater refers to any water that is found below the water table (underground). Groundwater is pumped to the surface through artificial (pumps) or natural (springs) means. Groundwater is susceptible to contamination when water comes into contact with contaminants in the soil or air (rainwater). Many of these contaminants originate from the same sources as contaminants for surface water.

- 34% of First Nation communities (Reserves) relied on surface water for their source water in 1994;
- 61 % of First Nation water facilities are supplied by ground water;
- Approximately 5% of First Nations rely on private wells, storage containers (cisterns) or Municipal Water Agreements;
- 14% of homes on reserve (approximately 10,500) did not have an indoor piped water supply as of 1996 (Indian and Northern Affairs Canada, 2008). As of 2001, the number of homes was down to 5,000 (National Aboriginal Health Organization, 2002).

Municipal Water Agreements between First Nations and local municipalities supply municipal water to a First Nation community. These agreements place the water quality under provincial standards. Private wells and storage containers are considered private property and are not regulated beyond the installation process. This creates a legal issue for First Nations since technically home owner's on-reserve do not own their property. Instead it is federal property and should be regulated by the government. The Expert Panel on Safe Drinking Water for First Nations (2006) recommends that this legal issue be addressed and that First Nations implement community regulations for the maintenance and monitoring of private wells and cisterns.

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## Treatment Facilities

Treatment facilities are engineered to deal with known contaminants in the source water as well as toxicants that may occasionally be found in water due to seasonal changes in water quality. A variety of treatment methods are used to filter water and make it safe for consumption. The methods include coagulation (chemicals or physical technique is used to make particles settle), flocculation (materials are added to attach to particles to make them settle), sedimentation (water is allowed to sit and particles from coagulation and flocculation settle), filtration (solids are removed when the water passes through a porous material) and disinfection (chemicals or natural processes are used to kill microbes). The type of method is determined by the quality and content of the untreated water (Cyberspace Chemistry, 2008). The most common disinfectant used is chlorine.

Water treatment facilities, when working properly, are able to eliminate harmful biological organisms such as E. coli. However, they are not designed to eliminate toxic metals or chemicals. The various techniques described above to remove solids and impurities may reduce the chemical burden but this occurs coincidentally and not because the treatment plant is set up to eliminate chemicals from source waters. There are some sophisticated techniques to do so but they are very expensive and rarely in place in most water treatment facilities. In cases where, water becomes contaminated with organisms, that cannot be neutralized by the treatment facility or there are mechanical problems with the facility where water cannot be adequately treated, Boil Water Advisories are issued or contingency treatment plans are initiated. Monitoring of water quality from source to tap ensures that these biological contaminants are caught and addressed as quickly as possible.

## Distribution System

Once the water has been treated, it travels through a distribution system that ends in the home. Monitoring of the water along the system is intended to “catch” any changes in the water quality that might occur due to problems in the piping systems. If the distribution system is faulty contaminants can re-enter the water. As well, the water may pick up contaminants from materials used in the distribution system including inside individual homes.

To assist in protecting the water while it travels through the system, small amounts of chlorine or other disinfecting chemicals are left in or added to the water after the treatment process. The level of these chemicals is considered to be safe for human consumption.

Households built prior to 1990 are very likely to contain lead-soldered copper water pipes. Homes built before the 1950s, particularly in the older parts of most cities, may have lead service lines running to the house unless they have been replaced by the municipality. Prior to 1990 lead solder was used to join copper pipes. When water sits in the pipes, lead can leach from the solder into any standing water in the pipes, particularly if the water is slightly acidic. It is recommended that water be allowed to run for several minutes after sitting for any time (overnight or long periods of disuse) before consuming. For the same reason, water from the hot water tap should not be used for preparing food or drinks.

## Concerns about Drinking Water

Drinking water can be contaminated in a number of ways by a number of different contaminants. There are naturally occurring chemicals and metals found in water such as arsenic, lead and mercury that are harmful to humans. Testing of the source water can determine the risk of these contaminants to water quality. Contaminants can also be introduced through industry (e.g. via industrial emissions to waterways or tailings from industrial sites such as pulp and paper mills and mines), agriculture (run-off of pesticides and herbicides into surface and groundwater), and residential use (mismanagement of wastes including grey water, sewage and household garbage).

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Water quality guidelines establish “acceptable” limits for contaminants (microbiological, chemical or radiological) based on evaluation of existing information (Bethune, 1997). Guidelines are set based on research from dose and reaction in animal and human exposures as well as information regarding tolerable levels of long-term exposure and potential health risks (Health Canada, 2008). For example, E. coli is a micro organism that is potentially deadly to humans as witnessed by the Walkerton Crisis in 2000. E. coli is not tolerated within a water supply since it is an indication that other potentially harmful microbiological contaminants have survived the treatment process.

It is important to understand that safe water does not necessarily mean risk free. The process that is used to treat water to ensure its safe consumption is selected based on the contaminants in a specific water source. In the process of ensuring that contaminants in the water are neutralized, chemicals may be added which pose their own risks. The most frequently used disinfection process is chlorination. But this process also poses potential harm to the consumers through the disinfection by-products, which are created when chlorine binds itself to organic material in the water forming a group of chemicals called trihalomethanes. Trihalomethanes have been linked to cancer and birth defects but the quantities found in treated water are considered negligible when compared to not treating the water (Minister of Indian and Northern Affairs Canada, 2006).

## **Impact on Children’s Health**

The human body relies on natural “filtration” systems that process or remove contaminants, particularly in the lungs, liver, kidneys and gastrointestinal tract. Each of these systems is under development in the womb and sometimes through to adulthood. A child’s underdeveloped systems are ineffective in protecting the child from toxicants including biological contaminants and chemicals in water (Canadian Partnership for Children’s Health and Environment, 2005). For instance, a child’s body will absorb 50-90% of ingested iron where an adult absorbs only 10% of ingested iron (Canadian Institute of Children’s Health, 1997).

Children consume a much larger quantity of water to their body weight than adults. Children also rely heavily on adults to monitor and restrict their behaviour including their access to contaminated water. As mentioned earlier in this manual, water contaminants such as heavy metals, polychlorinated biphenyls (PCBs), pesticides and other industrial waste can impact the health of a fetus and child.

## **Impact on First Nation Children**

In recent years, First Nation communities have been front and center in the discussions regarding water quality due to inadequate water treatment facilities and continuous and widespread need for Boil Water Advisories. In 2000-2001, Indian and Northern Affairs Canada (INAC) undertook an assessment of on-reserve water (serving more than 5 households) to determine the overall effectiveness of the treatment systems. It was found that 29% of the treatment facilities posed a potentially high risk of negatively impacting water quality, 46% were classified as medium-risk and the remaining 25% were in the low or no risk category (Indian and Northern Affairs Canada, 2003). Indian and Northern Affairs Canada (2007) dedicated \$600 billion in 2003 to ensure the safety of drinking water for First Nations. This included funds for the design and construction of water and wastewater facilities servicing First Nations, upgrades to existing water and sewer systems to bring the current facilities up to standard, training and monitoring of the water systems. As of February 2008 there were 93 First Nations under a Drinking Water Advisory (Health Canada, 2008).

For First Nation people residing off-reserve, provincial legislation and standards apply for the municipality in which they reside. Households that rely on private wells or cistern systems are required to meet provincial standards for installation but ongoing maintenance and water quality are the responsibility of the property owner. First Nation people living in urban areas face the same quality standards and concerns as the general population (Minister of Indian and Northern Development, 2006).

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Interviews with First Nation service providers and organizations identified that their communities have had to address a number of different sources of water contamination, particularly surface water contamination. There are concerns about lagoon systems in the north where raw sewage makes its way into the drinking water supply. Some water lagoon systems have been drained or contaminated by storm systems. Other water supply contaminants include soil erosions from clear cut forestry operations, road salt from highways and watercraft dumping sewage into lake water.

## Water Protection

There are many different kinds of water. Water can change even if it comes from the same place. Elder Gordon Waindubence shared a story of his travels around Manitoulin Island and his experience while learning about the water.

*One summer, some of us decided to paddle around Manitoulin Island. We set out and paddled hard for the first day. We crossed a bay where the water was clear where you could see the bottom clearly. The water was calm and beautiful. The next day we set out and paddled for a few hours. The water was rough and it took us hours to only go a few kilometres. We were sore and decided to stop for lunch. We pulled on to shore and I explored while the others rested. The water was thick with snakes (water snakes) in every crevice. This water was not healthy. Without telling the others, I told them we had to leave. We paddled farther down the shores and pulled into another bay for the night. There were cottages and cabins lining the shores. I went for a walk and saw a dumping site for the garbage. They didn't think or care about where they dumped their garbage since they don't have to live there. A creek running nearby was murky brown and smelled. The next day we carried on and crossed a bay with a river from inland where the water swirled. You couldn't tell in what direction the water was coming from. There are stories about water passages that connect the two sides of the island. This might have been one of these places. Over the next few days we passed through water that was black where you couldn't see anything or green with algae. The water was different everywhere we went.*

~Paraphrase of Elder Gordon Waindubence, 2008

Contaminants are introduced into the water system through point sources and non-point sources. Point sources are industrial sites and direct interaction with water where as non-point sources include run-off from roadways and agriculture. In order to protect the water, contaminants need to be minimized if not eradicated (Minister of Indian and Northern Development, 2006).

Source water needs to be protected including all access points for lakes such as rivers, streams, etc. Industrial sites require strict adherence to all environmental hazard legislation including proper design and maintenance of facilities that store toxicants that can leech into the environment. Sedimentary deposits that contain hazardous chemicals should be identified and precautions taken to ensure that they are not disturbed, or if possible, cleaned up (Ed Desson, 2007). Landfills and dumps require appropriate design and maintenance for subsurface protection and a leachate containment strategy to ensure pollutants are not filtering through the ground into the water system (Walpole Island Heritage Centre and Chreod Ltd. 2007). Households need to ensure that their water systems (wells, cisterns and septic systems) are functioning efficiently and that all household waste is disposed of properly. Refer to the Waste Management section for further details regarding household waste disposal.

*"I begin my day with a ceremony for the water. I present my morning water to the four directions and pray. I make an offering to the spirit of the water, the keeper of the water that knows all water. I petition to the spirit of the water that it be healed and cleansed. I acknowledge the water and ask for water to use each day. I always offer the water to Mother Earth and then I drink it."*

~Elder Josephine Mandamin, 2008

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## Bottled Water

*"Water is a living being. Like all beings it cannot survive when contained in plastic. It cannot breathe and remain healthy. While on a Water Walk, walkers began to feel ill after consuming bottled water that had been stored in a truck and later refrigerated. They could not smell or see anything wrong with the cooled water but when they opened a stored bottle they noticed the smell of mould and decay."*

~Elder Josephine Mandamin, 2008

*"Water belongs to all creation; every aspect of creation has a right to water. No one has the right to own or sell water."*

~Sister Priscilla Solomon, 2007

One-fifth of the Canadian population drinks bottled water exclusively. Many households rely on bottled water when under Boil Water Advisories or as an alternative to their water source. Although Canada has stricter standards for bottled water than other countries, it still only tests for three substances compared to the 350 monitored for by the provincial systems (Ottawa Express, 2008). Health Canada (2007) states, "All bottled water offered for sale must be safe for people to consume. Mineral or spring water must not contain any coliform bacteria or harmful substances at the source. (Emphasis added) Other bottled waters may undergo a variety of treatments and should meet the regulatory requirements for coli form and aerobic bacteria."

The debate regarding bottled water revolves around misinformation about the source of the water and the chemicals that leech from the plastic into the water. Bottled water companies advertise that bottled water is safer than other sources of water yet the water often comes from the same sources as municipal water or even from treated municipal water. A recent study completed by William Shoty, demonstrated that the longer water sat in a plastic bottle the higher the concentration of potentially harmful chemicals being leached from the plastic. Although some of the chemicals found were below recommended levels for human consumption there is concern regarding the long term health effects and the amount consumed over time (Canadian Press, 2008).

There is also concern regarding the safety of bottled water for vulnerable populations such as the elderly, infirm, some children and immune deficient individuals. Since bottled water can spoil over time if not stored in ideal conditions, it can contain mould and bacteria that can compromise an already unhealthy immune system (Natural Resources Defense Council, 1999).

## Strategies

### Service Providers

- Find out about the water concerns of their community. Each community will have different water source and treatment concerns. Information should be up to date and should address concerns from source to tap;
- Develop education plans to provide information regarding water concerns specific to their community. This includes information on any water borne diseases that are known to the community, contaminants found in the water source, medical treatment or advice regarding the concerns and special precautions for vulnerable populations;
- Increase support for the water source by banning bottled water from your organization. This includes removing bottled water from staff rooms, vending machines and using community water for all meetings, where drinking water quality is safe and tested regularly;
- Post information about the municipal water source and water treatment in public areas. Include information about the safety of bottled water;

- Post information regarding the proper storage of bottled water for emergency use or personal use. Health Canada provides information at the following website [www.hc-sc.gc.ca](http://www.hc-sc.gc.ca) under Food and Nutrition;
- Advocate for the community water source whenever the issue of water quality arises. Be aware of the community concerns and have information available to reassure them about the safety of the water supply, or for use in advocating for improved water quality;
- Work with the local government to advocate for financial support for adequate treatment facilities that meet the communities current and future water needs;
- Begin research to monitor water quality, community concerns, potential contaminant sources, and health effects linked to water quality. This includes biomonitoring and baseline data collected for a range of community members. Informal research can include recording community member complaints regarding skin conditions, digestive problems, turbidity complaints, and seasonal concerns and monitoring of wildlife;
- Implement community education programs that include information pamphlets on water concerns, potential hazards of contaminated water, household safety tips to protect source water, source water protection and information on health concerns linked to water quality;
- Identify natural spring and source water and take steps to protect the water from septic systems, storage areas, roadways and industry;
- Lobby government for source water protection, safe water quality, and stricter industrial accident reporting and clean-up requirements;
- Lobby government for stricter regulations for wells, water storage systems (cisterns) and septic systems.



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## Breastfeeding

*“Breastfeeding strengthens all relationships within the community and nation, not only the most obvious one of the mother and child but also within the extended family and community. As the extended family and community work to support the new arrival, it gives the people a sense of purpose, a vision for the future and re-enforces traditional values.” (Pemberton et al., 1995)*

Breast milk is the ideal food for babies. It provides the perfect amount of proteins, vitamins, and antibodies. Research has shown that breastfeeding reduces the risk of respiratory illness, ear infections, allergies, gastrointestinal disorders and possibly childhood obesity, diabetes and cancer (Nickerson, 2006; Government of Canada, 2006). Breastfeeding of children has also been linked with improved developmental, behavioural and learning outcomes (Canadian Institute of Child Health, 1997). Breastfeeding also benefits the mother by releasing necessary hormones to help contract her uterus and balance her hormones after birth. Mothers who breastfeed also experience better bone health and lower rates of ovarian and premenopausal breast cancers. Alongside these physical benefits are profoundly valuable emotional benefits to mother and child.

With all the benefits of breast milk, there are also concerns about the transfer of contaminants from the mother to the child. Trace amounts of chemicals, pesticides, heavy metals, polychlorinated biphenyls (PCBS), dioxins and a number of harmful substances have been found in breast milk. These contaminants are generally stored in the fatty tissues of the mother and are passed onto the baby through her milk (Condon, 2005; Nickerson, 2006).

In raising concerns about contaminants in the northern environment and in their own breastmilk, the Inuit women of northern Canada played an instrumental role in the creation and ultimate passage of the international treaty called the Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention on POPs).

Even with concerns regarding the risk of contaminants in breast milk, it is felt that the benefits of breastfeeding far outweigh the potential risks from contaminants. Breastfeeding provides the ideal nutrients for babies. In areas where there are concerns about the cost and access to formula, or concerns regarding water quality for formula preparation, there are even more benefits to breastfeeding.

- 60% of First Nation women on-reserve breastfed and 73% of First Nation women off-reserve breastfed compared to 82% for the general population;
- there was a 10% increase in breastfeeding for First Nation women on-reserve between 1997 and 2002/03 (Government of Canada, 2006);
- 43% of First Nation women on-reserve and 42% of off-reserve First Nation women breastfed for more than 6 months (Aboriginal Peoples Survey, 2001);
- 34% of on and off-reserve First Nation women breastfed between 3-6 months (Aboriginal Peoples Survey, 2001);
- 23-24% of on and off-reserve First Nation women breastfed up to 3 months (Aboriginal Peoples Survey, 2001);

## Strategies

### Service Providers

- Develop and implement a community wide information campaign to ensure that all community service providers have the same information regarding breastfeeding. This limits the amount of conflicting information provided to mothers. Update information a few times a year. La Leche League and Motherisk can provide valuable information. Distribute copies of “A Practical Workbook to Protect, Promote and Support Breastfeeding in Community Based Projects” from the Public Health Agency of Canada;

- Advocate for breastfeeding through education campaigns aimed at all women of childbearing years including youth. Include discussion about common myths about breastfeeding, research the benefits of breastfeeding and information about the risks of formula feeding;
- Remove ads for formula and formula paraphernalia from your organization. This includes removing growth charts, coupon booklets and so forth that advocate formula feeding. Ensure educational and promotional materials displayed or distributed follow the WHO International Code on the Marketing of Breast-milk Substitutes;
- Display material that encourages breastfeeding;
- Create breastfeeding friendly spaces which include comfortable chairs, privacy for mothers who choose this and staff that encourage breastfeeding;
- Create employee policies that support breastfeeding mothers. This demonstrates the organization's support of breastfeeding;
- Support training and education of any individual interested in becoming a community lactation specialist;
- If appropriate, provide breast pumps for loan to clients who need them;
- Have contact information for a lactation specialist available for clients even if contact must be made via the telephone;
- Advocate for the mother/baby breastfeeding relationship with health care facilities. Including dual admission into hospital or clinics for infant and mothers. Encourage pumping and storage if infant cannot room in;
- Advocate for the international implementation of the Stockholm Convention on POPs and the continued expansion of the treaty to include additional POPs notably all brominated flame retardants or PBDEs;
- Respect the right of mothers to choose not to breastfeed;
- Recognize that some women are not comfortable with breastfeeding due to issues such as trauma;
- Support breastfeeding alternatives for high risk mothers where breastfeeding poses significant risk to the child including transmission of diseases such as HIV/AIDS, drug users or the chronically ill. This includes having current information regarding risks and alternatives.



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## Fishing

*Fish have always been an important source of sustenance for First Nations people. Fish eggs were consumed to promote fertility since they contain omega oils and proteins. During pregnancy, women were encouraged to consume heavy fish such as sturgeon and whitefish, as it was known that the fat found in those heavy fish contained critical nutrients needed to support the baby brain development in the last trimester. It is during this time that a developing baby's brain undergoes a growth spurt.*

~Laurie McLeod-Shabogesis, 2007

Presently, fish are contaminated when their habitat is polluted with contaminants that cannot be naturally processed. The most commonly talked about contaminant in fish is methylmercury, an organic form of mercury created when this metal enters the aquatic food chain. Many environmental releases of mercury have begun to be controlled but coal-fired power plants remain the biggest and still inadequately controlled source of environmental emissions of mercury.

Unlike persistent organic pollutants (POPs), mercury is not stored in the fatty tissue of the fish. However, like POPs, mercury bioaccumulates as it makes its way up the food chain. This means that when a person eats contaminated fish or their eggs, they are consuming the accumulated contaminants from that fish and the fish it ate, etc. (Ship, 1997).

The amount of contaminants in fish has caused consumption advisories to be issued around the world. These advisories usually name a location, species and recommended consumption amount and rate. Larger meat eating fish are at a higher risk of containing larger quantities of contaminants notably mercury in the flesh, and various POPs in fatty tissues, due to bioaccumulation whereas smaller plant-eating fish pose less of a threat. The most common reason for assigning fish advisories in Ontario is because of elevated levels of methylmercury (Ministry of the Environment, 2008).

There are specific concerns for women and children. Women of child bearing years have accumulated contaminants within their fatty tissue which can be passed onto their unborn children or can hinder women's ability to conceive or maintain a pregnancy (Condon, 2005, Nickerson, 2006). Consumption of fish with elevated methylmercury levels during pregnancy can negatively impact on fetal brain development. Ironically, much research also confirms that fish, including fish with a high fat content, is very important for fetal brain development because of the beneficial effects of omega fatty acids. Pregnant women should not avoid fish but they should definitely follow fish advisories.

It is important to note that consumption advisories for fish are suggesting an amount of fish based on the high back meat rather than the whole fillet. The stomach muscle area stores contaminants (Ed Desson, Anishinabek Ontario Fisheries Resource Centre, 2007). This is a specific concern for many First Nation people who rely heavily on fish and wild game for their food especially when it is the practice to consume the whole fish. It is advised that vulnerable populations such as women and children strictly follow advisories. Everyone should avoid consuming any organ meat whether fish or wild game since contaminants are concentrated in these areas.

First Nation people who participated in EAGLE Project Health Survey (2001) consumed more freshwater fish than other country foods and have increased their consumption of country foods over the last ten years. When results were broken down into regions, the Lake Ontario and Lake Erie regions showed lower fish consumption levels. This might be associated with awareness of advisories, environmental concerns and change of lifestyle.

Ed Desson (2007) stated that a barrier to addressing this environmental concern is that First Nations distrust the government. They do not trust the government's information or recommendations, which can lead to not taking the information seriously.

## Strategies

### Service Providers

- Support existing projects that lobby the government for stricter emissions regulations for industry, particularly coal-fired power plants, to limit water and habitat pollution
- Have current information available regarding current fish consumption advisories for your community. Post information about kinds of fish, specific concerns and any important information;
- Advise woman and families about the risks and benefits to child health about eating fish. Suggest some alternatives to fish consumption (Omega 3 and 6 fatty acid supplements) and suggest the safest fish for them to consume;
- Have popular fishing locations and marinas posted with advisories;
- Lobby government for environmental protection of waterways and habitats;
- Reduce organizational impact on the environment by eliminating pesticide and herbicide use, finding natural alternatives to chemical products and ensure proper disposal of all waste;
- Advocate for whole fish contaminant analysis based on region. Set advisories based on this information;
- Work with individuals and government, develop and implement dumping policies for the appropriate and safe disposal of fish remains.



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## Policy and Program Implications

*"We have been teaching the people to look at themselves and to do a lot of searching within themselves. How much they get involved in causing pollution? Make sure they are always coming from their traditional teachings. They must respect the Earth in order for it to continue as we know it. As long as people are respectful, they are not going to allow themselves to make decisions that would hurt the Earth or the environment."*

~Elder Jake Swamp, 2008

### Precautionary Principle

Any policies or programs addressing environmental hazards should be developed with the precautionary approach. This approach is better known as the "better safe than sorry" approach where consideration is given to the safety of the environment and individual. More often, the approach used for policy development was the "wait and see" approach. Past outcomes that demonstrate the concerns with this approach include the negative impacts of lead and DDT where the health of the environment, wildlife and humans were affected before any regulatory action was taken. Repercussions of these contaminants can still be seen today although the use of these contaminants has been progressively restricted since the 1970's.

The precautionary approach does not allow for a lack of scientific data to be used as an excuse for the continued use of any product that might pose a risk of harm to human health or the environment. If it is suspected that a chemical used to produce materials or a by-product of industry might be causing harm, then that product should immediately undergo research and/or its use should be limited, if not eliminated.

### Avenues of Policy Development

There are three avenues for influencing policy and program development based on the information provided within this manual. Change requires involvement from all levels of society including familial, communal, national and international. Although changes created by one level can be beneficial without support by all levels, the benefits will be minimized long-term. The three avenues are:

- No significant changes are made to reduce or eliminate the negative impacts of environmental hazards.
- Significant changes are made regarding environmental hazards.
- Stricter legislation and regulations are developed that address environmental hazards to minimize the impact on human health, particularly children's health.

### No Significant Change to Environment

In the first instance, no changes to the impact of contaminants on the environment will mean an increased need by the health care and education systems to adapt to the long-term health impacts of environmental contaminants on the public, in particular children and the aging population. Continued daily exposure to known and suspected carcinogens, developmental neurotoxicants, developmental and reproductive toxicants, respiratory toxicants and hormone disruptors will mean a decrease in health outcomes, children with long-term health problems and a need to address developmental, learning and behavioural problems within the education and health care system. There will be a need for an increase in resources to education and health care to keep up with the number of children, young adults and adults in need of long-term care. Education programs will need to address social, behavioural and intellectual problems caused by exposure to contaminants including the ability to address subtle to critical extremes.

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First Nation communities will continue to struggle with insufficient funds for the development and maintenance of infrastructure, health and social services. The young age of the First Nation population will put a strain on services and resources as more individuals suffer from long-term health effects due to environmental hazards. Communities will continue to struggle to have concerns addressed by government including resource management and environmental protection.

## **Significant Change to Environment**

In the second instance, significant changes to environmental policies will lower the exposure of individuals to contaminants. Much like DDT and PCBs over time, exposure levels will decrease and hopefully also the negative health impacts associated with them. Regulations and legislation will have to be developed to enforce strict environmental codes including the approval of all chemicals whether industrial, commercial or residential. Alternative products will have to be tested and regulated under new legislation to ensure the health and well-being of individuals. Education programs will still be necessary to address the development, behavioural and intellectual impacts felt by the current generation and possibly the next.

First Nation communities will enter into partnerships for the development of policies and programs to address environmental hazards facing their communities. Resource management and program development will focus on protection rather than remediation. Communities suffering from environmental contamination will focus on remediation of past contamination rather than daily hazards created by industry.

## **Long-term Policy and Legislative Change**

In the third instance, existing regulations are enforced and some codes regarding chemical approval and use are improved to minimize impacts on human health. The precautionary approach changes the focus from the need to prove harm to the need to prove no harm. Chemicals that pose harm to human health would be phased out and replaced with environmentally friendly alternatives. Industries would be monitored and regulated under stricter protocols with an emphasis on reducing and eliminating impacts to the environment and health. In this instance, resources will still be necessary to address the negative health impacts that will be felt for generations including health care and education. Communities will have to develop long-term policies that will address the long-term health impacts beginning with childhood, and including access to long-term care facilities and support programs for individuals suffering from disabilities brought on by environmental hazards. Over time individuals and communities will see a reduction in the incidence of health problems associated with environmental hazards.

First Nations will see similar benefits to the general population including a reduction in contaminants. Alternatives will be more readily available at a lower price due to government intervention and support. This means access to cleaner energy, housing and waste management.

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## First Nation Policies and Programs

*"We need to realize that the spirit of the fire dwells within the circle of life. What we need to do, is look beyond, not what is in front of us but look beyond to all the spirits of nature and mother earth. See what we are doing to that environment, and how we can rekindle that gentle fire within ourselves, within creation and within life itself."*

~ Ken Tabobondung, 2008

There was a common theme during discussions with interviewees and Elders for this manual. There is a need to return to the teachings. It is recognized by service providers, Elders, political leaders and First Nation organizations that the teachings provide a foundation for future environmental work. Blending science with traditional knowledge provides credibility to the mainstream population and governments, which allows First Nations to develop programs that meet their cultural and traditional needs while satisfying the requirements of research and outcomes.

Elder Jake Swamp states that First Nations can use the teachings but they might have to find new ways of using them. They can't return to the old ways because things have changed, like lifestyles and reliance on products or money, but they can find new ways of achieving the same ends. Communal living, where the hunt was shared, might not work the same way now, but if everyone could learn to share the wealth in the community everyone would benefit. Indigenous people from around the world share their knowledge on the international scale with the hopes of providing a means to help the environment.

First Nation policies and programs need to find a blend of culture, science and politics. Examples of efforts being taken are the development of the Anishinabek Women's Water Commission and the partnerships between First Nation organizations and mainstream governments (Chiefs of Ontario and Environment Canada) to address environmental issues such as source water protection in a holistic and culturally appropriate manner. It is not enough to adapt mainstream programs with First Nation content. It is essential that all aspects of the process balance culture, community needs and modern realities.

First Nation communities must continue to find alternatives to the existing systems of waste management, energy development and infrastructure. Communities across Canada are experimenting with great success on the development of alternative housing, clean energy and alternative waste management systems. A nation wide communication plan is needed so community members and community leaders can share information freely.



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## Appendix

Table of Contents .....	7
Introduction .....	8
Medicine Wheel .....	9
Importance of Children to First Nations .....	11
Vulnerability of Children .....	12
Greater Exposure and Sensitive Life Stages .....	12
Environmental Health Concerns for Children .....	13
Developmental Neurotoxicants .....	13
Impact on First Nations .....	13
Hormone (Endocrine) Disruptors .....	13
Impact on First Nations .....	14
Respiratory Toxicants .....	14
Impact on First Nations .....	14
Reproductive and Developmental Toxicants .....	15
Impact on First Nations .....	15
Carcinogens .....	16
Impact on First Nations .....	16
High Dose vs. Low Dose Exposure .....	16
First Nation Response .....	18
Métis Response .....	20
First Nation Statistics .....	21
Air .....	22
Outdoor and Indoor Air Pollutants .....	25
Impact on First Nation Children .....	26
Tobacco use .....	27
First Nation Statistics .....	28
Traditional Tobacco Use .....	29
Strategies .....	30
Service Providers .....	30
Pesticide and Herbicide Use .....	30
Impact on First Nation Children .....	31
Strategies .....	32
Service Providers .....	32
Household Chemicals .....	32
Impact on First Nation Children .....	33
Strategies .....	33
Service Providers .....	33

Earth .....	35
Food Source Contamination.....	38
Wildlife and Natural Vegetation .....	38
Impact on First Nation Children .....	39
Strategies.....	40
Service Providers .....	40
Soil Contamination.....	41
Impact on Children’s Health .....	41
Impact on First Nation Children .....	42
Strategies.....	42
Service Provider.....	42
Waste Management .....	43
Wastewater (Sewage) Management.....	43
Impact on First Nation Children .....	44
Strategies.....	44
Service Providers .....	44
Solid Waste Management.....	45
Reduce.....	45
Reuse.....	45
Recycle .....	45
Environmental Hazards of Solid Waste .....	45
Impact on First Nation Children .....	46
Strategies.....	46
Service Providers .....	46
Housing .....	47
Building Materials .....	47
Impact on First Nation Children .....	48
Strategies.....	48
Service Providers .....	48
Mould.....	49
Impact on First Nation Children .....	49
Strategies.....	50
Service Providers .....	50
Fire .....	51
Heating Sources.....	52
Wood Burning.....	54
Oil Burning.....	54
Natural Gas Burning.....	54
Impact on First Nation Children .....	55
Strategies.....	55

Service Providers .....	55
Emissions from Combustion.....	56
Industry.....	56
Residential .....	56
Transportation.....	57
Impact on First Nation Children .....	57
Strategies.....	58
Service Providers .....	58
Water.....	59
Water Contamination .....	61
Source of Water.....	62
Treatment Facilities.....	63
Distribution System .....	63
Concerns about Drinking Water .....	63
Impact on Children’s Health.....	64
Impact on First Nation Children .....	64
Water Protection .....	65
Bottled Water .....	66
Strategies.....	66
Service Providers .....	66
Breastfeeding.....	68
Strategies.....	68
Service Providers .....	68
Fishing .....	70
Strategies.....	71
Service Providers .....	71
Policy and Program Implications .....	72
Precautionary Principle .....	72
Avenues of Policy Development .....	72
No Significant Change to Environment.....	72
Significant Change to Environment .....	73
Long-term Policy and Legislative Change .....	73
First Nation Policies and Programs .....	74
Resource List.....	75
References .....	75
Interviews .....	81
Websites .....	82
Appendix .....	84
Kanian’Kehaka (Mohawk) Prayer of Thanksgiving: A Good Morning Message/Prayer .....	88
Handouts .....	89

---

Air: Tobacco Use .....	90
Traditional Tobacco Use .....	90
What can Families do? .....	90
Air: Pesticide and Herbicide Use.....	91
First Nation People .....	91
What Can Families Do? .....	91
Air: Household Chemicals.....	92
What Can Families Do? .....	92
Earth: Food Source Contamination.....	93
First Nation Families .....	93
What Can Families Do? .....	93
Earth: Soil Contamination.....	95
First Nation Families .....	95
What Can Families Do? .....	95
Earth:Waste Management .....	96
First Nation Families .....	96
What Can Families Do? .....	96
Earth: Housing .....	98
First Nation Families .....	98
What Can Families Do? .....	98
Fire: Home Heating.....	101
What Can Families Do? .....	101
Fire: Emissions from combustion .....	102
First Nation Families .....	102
What Can Families Do? .....	102
Water: Water Quality .....	103
First Nation Families .....	103
What Can Families Do? .....	104
Water: Breastfeeding.....	105
First Nation Families .....	105
What Can Families Do? .....	105
Water: Fishing.....	106
First Nation Families .....	106
What Can Families Do? .....	106

# *Kanian'Kehaka (Mohawk) Prayer of Thanksgiving: A Good Morning Message/Prayer*

"Ohenton Kariwatehktwen Teithinonwaratonkhwa"

Akwekon onkweshona entitewatkawe ne kanonhweratonhtsera.

Teithinonwaratonkhwa ne Ohnekashona.

Teithinonwaratonkhwa ne Ohtonteshona.

Teithinonwaratonkhwa ne Kakhwashona.

Teithinonwaratonkhwa ne Kahishona.

Teithinonwaratonkhwa ne Ononhkwashona.

Teithinonwaratonkhwa ne Kontirio.

Teithinonwaratonkhwa ne Karontashona.

Teithinonwaratonkhwa ne Otsitenokona.

Teithinonwaratonkhwa ne Kaieri Nikawerake.

Teithinonwaratonkhwa ne Ahsonhthenhneka Karakhwa.

Teithinonwaratonkhwa ne Tshitewahtsia Karakhwa.

Teithinonwaratonkhwa ne Otsistohkwashona.

Teithinonwaratonkhwa ne Kaieri Niionkwetake.

Teithinonwaratonkhwa ne Shonkwaiatison.

## **Translation by Chief Jake Swamp (American Indian Health Council, 2008)**

To be a human is an honour, and we offer thanksgiving for all the gifts of life.

Mother Earth, we thank you for giving us everything we need.

Thank you deep blue waters around Mother Earth, for you are the force that takes thirst away from all living things.

We give thanks to green, green grasses that feel so good against our bare feet, for the cool beauty you bring to Mother Earth's floor.

Thank you, good foods from Mother Earth, our life sustainers, for making us happy when we are hungry. Fruits and berries, we thank you for your color and sweetness.

We are thankful to good medicine herbs, for healing us when we are sick.

Thank you, all the animals of the world, for keeping our precious forests clean.

All the trees of the world, we are thankful for the shade and warmth you give us. Thank you all the birds in the world, for singing your beautiful songs for all to enjoy.

We give thanks to you gentle Four Winds, for bringing clean air for us to breathe from the four directions.

Thank you, Grandfather Thunder Beings, for bringing rains to help all living things grow.

Elder Brother Sun, we send thanks for shining your light and warming Mother Earth.

Thank you Grandmother Moon, for growing full every month to light the darkness for children and sparkling waters.

We give you thanks, twinkling stars, for making the night sky so beautiful and sprinkling morning dew drops on the plants.

Spirit Protectors of our past and present we thank you for showing us ways to live in peace and harmony with one another.

And most of all, thank you Great Spirit, for giving us all these wonderful gifts, so we will be happy and healthy every day and every night.





# Handouts

*Handouts*



## Air: Tobacco Use

*There is a fire that burns within us. In order for the fire to burn strongly we have to feed it positive energy and positive things. We have to learn that when we put that tobacco in our bodies it takes away from us. It is killing us. Our children see and learn from us. We need to teach them what we were taught by our ancestors. We need to teach them about the environment, and how to use tobacco in a sacred manner. Parents have to create that kindness within themselves so they can create that kindness within that child. To be healthy without cigarettes, alcohol or drugs.*

~ Ken Tabobondung, 2007

The use of commercial Tobacco products is a growing concern in native communities. Products such as cigarettes, chew, and cigars are known to cause cancer, respiratory illness and heart disease. Smoking or being exposed to second hand smoke during pregnancy can affect the health of the baby including low birth weights, increased miscarriage and physical abnormalities. Children exposed to tobacco smoke have increased risk of heart disease, respiratory illness and cancer and are more likely to take up smoking later in life.

### Traditional Tobacco Use

First Nation people use tobacco to communicate with the Creator. Traditional tobacco does not have the additives that commercial tobacco products have and it is grown in a traditional manner with respect. When used in ceremonies tobacco smoke is not inhaled but released to take prayers to the Creator.

### What can Families do?

- Declare your house and car a smoke free zone. This should be a smoke free zone at all times not just when children are present. Post signs or stickers on doors and windows to make people aware of this;
- If you smoke, limit your smoking to outdoor areas away from intake vents, windows and doors;
- Never smoke around children whether you're own or other peoples. This will decrease the likelihood that these children will see smoking as an acceptable activity;
- Talk to your children about tobacco use. If you use it traditionally, explain why it is used, how it is grown and what makes it different than commercial tobacco. If you smoke, talk to your children about why it is a poor choice;
- Seek help if you would like to quit. This includes joining a community cessation group or seeking medical assistance regarding the use of cessation products (ex. cessation gum, patches);
- Motivate your community to develop and implement community-smoking policies that address smoke-free school zones, workplace smoking policies, by-laws and education campaigns and most importantly outline the cultural use of tobacco.

**For additional information about tobacco use and help quitting, contact your local Health Unit or Center.**



# Air: Pesticide and Herbicide Use

Children are exposed to pesticides and herbicides in their homes, in public areas including parks and recreation centers and in the air. Farmers and forestry companies use pesticides and herbicides to control pests and unwanted plants. These chemicals can travel long distances in the air. Wildlife, water, soil and air quality are affected by pesticides and herbicides. Pesticides and herbicides are linked to cancer, respiratory illness, reproductive problems and development problems in children.

## First Nation People

First Nation people have a closer relationship to the land which includes the consumption of wild meat and traditional medicines. Since pesticides and herbicides contaminate wildlife, natural vegetation and the water supply, First Nation people are at risk of ingesting these harmful chemicals. Despite the risk of contamination in wild game and fish, the benefits of eating an organic, country diet outweigh the potential harm (Lorilee McGregor, 2008).

## What Can Families Do?

- Reduce if not eliminate the use of all chemical pesticides and herbicides within your home, lawn and garden;
- Use alternative pesticide and herbicide formulas that can be found in natural food stores or online at resource centers such as;
  - your communities website,
  - [http://www.ns.ec.gc.ca/epb/factsheets/pesticides/non\\_pest.html](http://www.ns.ec.gc.ca/epb/factsheets/pesticides/non_pest.html);
  - <http://www.gca.ca/indexcms/index.php?pfn>
  - Gardening websites
  - Environmental group websites
- Reduce exposure to pesticides and herbicides by buying organic food if possible including meat and dairy products or peeling all fruit and vegetables and cutting away all fat from meats;
- Return to a traditional diet with higher amounts of berries, vegetables and wild meat. Cut away fat from wild meat to reduce amount of contaminants ingested. Wash all fruits and vegetables to remove chemical residues;
- If using pesticides read the label carefully and follow all instructions. Remove children from the sprayed area for the recommended time, ventilate the area and wash down all surfaces after use to remove as much residue as possible;
- Be aware of pesticide and herbicide use in your area including agricultural, forestry and cosmetic uses (parks, gardens and lawns). Find out the effects of these pesticides and possible health impacts to your children;
- Lobby for local government whether on-reserve or off-reserve to ban the use of cosmetic pesticides in local areas such as parks, schoolyards, golf courses and private lawns and gardens;
- Control dust within the home to reduce the level of contaminants;
- Open windows and doors when possible to allow air flow to clear the air of indoor pollutants;
- Do not harvest medicines or wild edibles near hydro lines, on or near radio active or contaminated lands, or areas where pesticides are used.

**For additional information regarding pesticides and herbicides contact Service Canada, your local Health Unit/Center and Public Works.**



# Air: Household Chemicals

Household chemicals can be found in personal hygiene products (soap, shampoo), beauty products (makeup), cleaning chemicals, furniture and building materials. Household chemicals affect the air quality in the home. Children exposed to household chemicals have increased risk of respiratory illness, developmental disabilities and physical reactions such as rashes and vision problems.

## What Can Families Do?

- Read all labels of chemicals and personal care products for instructions on use, storage and disposal of the product;
- Use alternative cleaning products including baking soda, vinegar, lemon juice and salt;
- Rinse cleaned areas with water to remove residues left behind by chemical cleaners;
- Avoid the use of air fresheners and deodorizers. Use natural fragrances such as flowers and spices or open windows to freshen indoor air
- Leave all products in their original containers with the proper lid and labels;
- Ensure that all child proof lids work properly;
- Dispose of household products according to their instructions;
- Monitor for signs of poisoning including breathing problems, skin rashes, headaches, nausea and seek professional help immediately;
- Know poison control contact information for your community;
- Learn more about the chemicals found in building materials that can harm your children including preservatives used in wood products, insulation and fumes from finishes like paint;
- Dispose of unused or outdated medications at a hazardous waste facility, health centre or pharmacy.

**For additional information about the health affects of household chemicals contact Service Canada, Parenting and children programs and the local library.**



# Earth: Food Source Contamination

*The Pima Indians returned to their own ways of eating and the diabetes disappeared. Returning to our own traditional diets can get rid of diabetes although it might take many generations. It will not be easy and we really have to work at it.*

~ Elder Jake Swamp, 2007

Food comes into contact with a large variety of environmental hazards from growing to processing. Pesticides and herbicides used while growing, preservatives used during processing and the containers used to store food affect the health of the food that your children consume. Health affects linked to environmental contamination of food include cancer, skin infections/rashes, decreased immune systems, liver, kidney and reproductive problems.

## First Nation Families

Over time First Nation people have been moving away from their traditional diets of wild meat and vegetables. The new diet of processed food high in fat, sugars and preservatives has been linked to obesity and diabetes. Although there are concerns with contamination of wildlife, fish and vegetables a return to a more traditional diet can improve health and reduce exposure to many contaminants found in processed foods.

*Anishinaabe people have problems processing many store bought, prepared foods particularly those containing refined sugars, dairy and wheat. An organic, country diet high in whole foods such as vegetables, fish and wild meat allow the individual to monitor and limit fat, salt and sugar in their diets.*

~ Lorilee McGregor, 2008

## What Can Families Do?

- Learn traditional food gathering methods including hunting, fishing and harvesting as well as preservation methods such as drying and preserving;
- Adopt a more traditional diet including;
  - Limit dairy (substitute low-fat varieties for whole fat);
  - Limit wheat – Substitute more digestive grains such as spelt and whole grains;
  - No refined sugars including fructose and glucose;
  - Eat wild fish 2-3 times a week (follow fish consumption guidelines for your area);
  - Reduce consumption of red meat and pork. Eat smaller portions of organic lean wild meat (McGregor, 2007).
- Reduce consumption of organ meats such as liver and kidneys where contaminants are stored;
- Cut away all fat from meats prior to cooking and do not allow food to cook in its fat;

- Be aware of consumption guidelines for contaminated food products including wild meat consumption, microbiological contaminants found in processed food or fruits and vegetables;  
<http://www.inspection.gc.ca/english/toce.shtml> (food recalls, fish consumption);  
<http://www.ene.gov.on.ca/envision/guide> (fish guidelines)
- Clean and peel all fruits and vegetables to reduce ingestion of pesticide residue;
- Cook food thoroughly to kill bacteria;
- Throw away burnt food especially from barbeques since they contain cancer causing agents;
- Throw away scratched or damaged non-stick pots and pans;
- If using non-stick cookware, cook over low to medium heat to protect food from the transfer of chemicals from the cookware;
- Use glass containers to store food;
- Do not heat food in plastic containers including baby bottles since contaminants can leach into the food from the plastics.

**For more information contact your local Health Unit/Centre or Environment Canada.**



# Earth: Soil Contamination

The Earth (Soil, dirt) around your home and community can contain a lot of different environmental hazards including pesticides, heavy metals, human and animal waste. These contaminants come from local industry, forestry, farming, improper disposal of household waste and from the maintenance and wear and tear on exterior painted surfaces (on homes built prior to 1976). The health affects associated with soil contamination include but are not limited to birth defects, respiratory, reproductive, intellectual and physical development problems.

Children are exposed to contaminated soil when they play especially when they put their hands, toys and objects in their mouths.

## First Nation Families

Many First Nation communities are located close to environmental “hotspots” where contaminants get into the soil, air and water from factories, farms and mines. Communities also have problems controlling the contaminants that make it into their soil from illegal dumping of hazardous materials, improperly built landfills and managed landfills and backyard storage of household waste.

### What Can Families Do?

- To limit soil contaminants in the house, remove all outer footwear when entering the home;
- Clean the house of dust using a wet rag;
- Get rid of very old carpeting especially in children’s play areas as it contains high levels of dust which is often contaminated with toxic chemicals;
- Know what contaminants are in the soil surrounding your home and community. Contact your local government for contact information or publications regarding contamination;
- Store and dispose of household chemicals and hazardous waste properly to minimize soil contamination. Do not store household chemicals or waste in your backyard or where children can be exposed to it;
- If plant life will not grow in the soil it is potentially contaminated. Have this soil tested to determine what you can do to clean-up the area. For a list of Soil testing laboratories check the Ministry of Agriculture, Food and Rural Affairs at [www.omafra.gov.on.ca/english/crops/resource/soillabs](http://www.omafra.gov.on.ca/english/crops/resource/soillabs).

**For more information contact your local gardening or horticultural society, Health Unit/Centre and Environment Canada.**



# Earth: Waste Management

Urban and rural communities are faced with having to dispose of increasing amounts of garbage and wastewater (sewage). Very few First Nations have the financial resources to participate in and maintain recycling campaigns. A lot of the garbage created by households and industry is hard to dispose of safely and poses harm to children. The concern with waste disposal is that chemicals found in garbage, waste products made by industry and improperly managed landfills/dumps can contaminate soil, water and air. The proper treatment and disposal of household sewage requires a community system or septic system that is properly built and maintained. Health affects associated with exposure to contaminated soil, water and air include but are not limited to reproductive, respiratory, physical and intellectual development problems and cancer.

## First Nation Families

Many First Nation communities do not have properly maintained landfills/dumps, recycling centres or hazardous waste centres. These communities also have problems with illegal dumping and backyard storage of hazardous waste which poses harm to children and their families.

Many First Nation communities and families have problems with sewage disposal and treatment because of improperly built and maintained community sewage or private septic systems. These problems can lead to water and soil contamination.

## What Can Families Do?

- Avoid contaminated soil and water that has been exposed to sewage by respecting Boil Water Advisories and no swimming/fishing warnings;
- Contact your health department and doctor if symptoms of infection occur including diarrhea, vomiting, nausea and fever, particularly for children, pregnant women and the elderly;
- Wash food with uncontaminated water if it is being eaten raw;
- Teach your children how to properly wash their hands with soap and water after using the bathroom, before eating and after playing;
- Have pets that have diarrhea or have symptoms of being ill treated by a veterinarian. Limit contact between children and the pet until treatment is complete;
- Have your septic system inspected for damage and make the necessary repairs to ensure it is safe and effective. Use provincial standards as a guideline if no standards exist in your community;
- Have your septic system pumped out as often as needed to ensure the septic system works properly;
- Do not overuse your septic system, which means limiting input to the standards of the system. Contact your local health or building department for standards;
- Do not dispose of chemicals including personal care products or medications, into your septic or sewer system. This compromises the effectiveness of your septic system or your community wastewater system;
- Report raw sewage spills to your health department and protect the area by putting up fencing. Follow the instructions of your health department and Public Works department;
- Reduce household waste by buying in bulk, limit packaging, and recycle when possible;

- Advocate for a recycling program that reroutes waste and generates revenue for the community;
- Dispose of hazardous household waste at a hazardous waste site, do not pour waste down household drains or dispose of in backyard sites;
- Do not burn any waste indoors or outdoors;
- Exchange goods with community members instead of throwing out products;
- Teach children to stay away from waste disposal sites including illegal dumps;
- Dispose of all waste at your designated community or municipal landfill;
- Participate in community clean-up programs to eliminate illegal dumps;
- Purchase or build your own composter. Learn how to use a composter particularly in your climate to ensure that the waste breaks up. Use your compost as a natural fertilizer in your yard or garden;
- Dispose of unused medications properly through a hazardous waste site, pharmacy or health centre.

**For more information contact your local public works department, Health Unit/Centre and Environment Canada.**



# Earth: Housing

There are a lot of contaminants found in building materials, furniture and household chemicals that may harm the health of a child. The large variety of chemicals found in personal hygiene products, building materials including paints and flooring and the home heating system have been linked to health risks such as reproductive and developmental problems, cancer and respiratory illness.

There is concern about the impacts of mould on the respiratory health of children and their families. Moisture problems linked to poorly built and drained basements and a lack of ventilation causes mould to grow in the home. In small amount the mould can be cleaned up by the family but in larger areas the mould will have to be removed by professionals and renovations completed on the house.

## First Nation Families

First Nation people tend to live in a lower standard of home whether they live on-reserve or off-reserve. There are problems with overcrowding, a lack of maintenance of rental homes and poorly designed houses that contribute to the health concerns related to housing. These concerns include the use of unhealthy building materials and moisture problems because of improperly built and maintained water and septic systems.

### What Can Families Do?

- Protect children from exposed toxic materials in the house including paint chips, scrap building materials and insulation. Clean up any damaged walls, windows and floors;
- Limit contact with contaminants including pesticides, tobacco smoke and harmful household chemicals;
- Recognize house dust (and dryer lint) as the place where contaminants in the home often end up; clean up with a vacuum cleaner or with moisture and reconsider the use of carpeting, especially for children's play areas;
- Avoid the use of pressure treated wood (treated with pesticides and until 2004 treated with CCA - chromated copper arsenic). Instead use cedar, redwood, metal or plastics. For more information, <http://www.pmra-arla.gc.ca/english/pubs/fact-e.html>;
- If you have a structure with pressure treated wood built prior to 2004, treat it with an oil-based wood finish (every year to two years), wash hands after contact with the wood, avoid contaminating food products by covering wood prior to use as containers and do not compost or burn pressure treated wood;
- If planning renovations or repairs choose environmentally friendly materials with minimal toxicants. For information on these products check out:
  - Canadian Mortgage Housing Corporation – <http://www.cmhc-schl.gc.ca/>
  - Safe Building Solutions – <http://www.safebuildingsolutions.com>
- Find out what kinds of building materials were used in your house including types of paint, insulation and chemically treated wood, fabrics and flooring. Locate information on how to limit exposure to toxicants from the manufacturer, Health Canada or building centres;
- Check out funding programs for renovations and repairs to your home;

- Canadian Mortgage Housing Corporation – <http://www.cmhc-schl.gc.ca>
- Indian and Northern Affairs Canada – <http://www.ainc-inac.gc.ca/>
- Dispose of building materials properly in landfills or hazardous waste depots. Do not burn building materials;
- If a small area (3 feet by 3 feet in area) is affected by mould, thoroughly clean the area with soap and water. Dry the area immediately. Wear protective equipment including gloves and dust mask;
- Larger areas of mould require professional treatment and possible replacement of materials including drywall, carpets and insulation;
- Locate the source of moisture causing the mould problem and have it repaired including replacement or improvement of ventilation systems, foundation or roof repairs;
- Immediately address mould when the problem is noticed by cleaning the area or having it professionally cleaned;
- Seek help from your health department for information on testing and health impacts of mould;
- Monitor your family for health effects of mould including problems with breathing, allergic reactions or eyes, nose and throat irritation;
- Remove items that might be contaminated by mould from the house, for example clothing or firewood.

**For more information contact the Canadian Mortgage and Housing Corporation, building centre and public works department.**





# Fire: Home Heating

A properly installed and ventilated home heating system can protect your children from exposure to harmful gases created by natural gas, oil, propane or wood heating. Any heating system that burns something to make heat produces harmful gases like carbon monoxide, nitrogen oxide as well as toxic contaminants like dioxin, furans and particles in the air. These contaminants are linked to respiratory illness, reproductive problems, cancer and birth defects.

All heating systems should be inspected and approved by a licensed technician to ensure gases are properly vented and the fuel is being efficiently burnt.

## First Nation Families

Many First Nation families live in substandard houses that are poorly maintained and built. This could mean poor ventilation and improperly maintained heating systems that expose the family to toxic gases.

### What Can Families Do?

- Replace your inefficient wood stove or fireplace with a sealed, advanced combustion wood stove and fireplace certified by the Canadian Standards Association;
- Burn clean, dry wood that has been dried for at least 6 months in a dry area;
- Provide ventilation at the initial burn and close the damper when wood is charred to improve the complete combustion of the wood;
- Install carbon monoxide detectors and replace batteries regularly (follow installation instructions);
- Monitor health effects associated with fossil fuel burning including eye, nose and throat irritation, respiratory illnesses including asthma attacks, headaches and dizziness;
- Research alternative heating sources such as solar hot water heating systems, in floor radiant heating, waste product and waste energy heating systems including funding sources  
<http://www.alternative-heating.com>  
<http://www.heatinnovations.com>  
Indian and Northern Affairs Canada – Aboriginal and Northern Community Action Program
- Have your oil and gas furnace system inspected to ensure fumes are properly vented;
- Clean or replace the air filters in your furnace annually to improve efficiency;
- Check your home for energy leaks particularly around windows, doors, vents and the roof. Seal leaks with caulking, weather stripping or replace damaged parts.

**For more information contact a local heating and cooling specialist or housing department.**



# Fire: Emissions From Combustion

*When there are toxic fires like when we burn tires, the smoke rises into the air sending up particles that flow off into the environment. The particles settle into the snow in the north where the sun heats the particles causing them to melt the ice and glaciers.*

~ Ken Tabobondung, 2008

Any product that can be burned creates gases and particulate matter which pollutes the air, soil and water. From vehicle to industrial emissions, contaminants released during burning impact the respiratory, reproductive and development health of children. By limiting the burning of household waste, treated wood products including furniture and fossil fuel in home heating as well as vehicles, families help protect their children from pollutants in the air, soil and water.

## First Nation Families

Like the non-native population, First Nation families rely on fossil fuel to heat their homes, run their vehicles and transport products to local stores.

### What Can Families Do?

- Reduce your use of vehicles by car pooling, walking, biking or taking public transportation;
- Purchase energy efficient products including appliances, heating systems and vehicles;
- Purchase local products including clothes, food, household supplies;
- Practice the 3 R's (reduce, reuse and recycle) to limit the number of new products you consume;
- Monitor health effects associated with greenhouse gas emissions including respiratory problems, skin disorders, nausea and dizziness.

**For more information contact your local public works department or Environment Canada.**



# Water: Water Quality

*Water has a purpose. Every river has a purpose. It needs to flow in its own ways. Dams take away the responsibility of the water. The water doesn't do its work.*

~ Elder Josephine Mandamin, 2008

Contaminants enter the water system through the air and soil. Industry, farming, forestry and residential waste contribute a wide variety of contaminants that can affect the health of wildlife, fish, and the quality of drinking water. Pesticides, herbicides, household chemicals, human waste, industrial waste and even naturally occurring metals or chemicals can make water unsafe for drinking.

Water treatment facilities are intended to treat water to make it safe for consumption. Private wells must be treated by the household before the water is consumed. To ensure the safety of the water, bacteria, and particulate (sand, leaves) have to be removed or treated before people can drink the water. If the water treatment system is not built to treat the water for a contaminant, then the water poses harm to children and their families. Drinking water treatment facilities are not equipped to filter metals and chemical contaminants. Additional filtering is necessary such as using an activated carbon filter (e.g., Brita) or an equivalent filter installed on the tap.

Health effects associated with unsafe water include reproductive and developmental problems, birth defects, skin rashes, digestive problems and poisonings. To protect children, water should be tested for contaminants and then treated for these contaminants.

Bottled water is often used as a safe alternative to well or treated water. There are concerns that unsafe chemicals from the plastic bottles can get into the water. There are also concerns that bottled water does not have to meet the same high standards set for treated water from municipal water plants.

*If you put cedar in a plastic bag, it will mould and rot. How long would you last in a plastic bag? Medicines should be kept in paper or cloth. Water should not be kept in plastic for the same reason.*

~ Elder Josephine Mandamin, 2008

## First Nation Families

Many First Nation communities have inadequate water treatment facilities that are poorly designed and maintained. A lack of trained staff and financial resources means a higher number of boil water advisories for longer periods of time. This problem is being resolved through training programs and investments by the government in a higher standard of water treatment.

For smaller or rural communities where wells are used, the well water may become contaminated by household waste, improperly maintained landfills/dumps and local industry. Lack of proper treatment systems, maintenance companies or testing labs can limit the ability of the homeowner to make the water safe for drinking.

## *What Can Families Do?*

- Know your water source, whether municipal or private. Know what toxicants or contaminants are found in the source water and how the treatment facility filters the water for these contaminants;
- Be aware of any potential sources of contaminants that can effect your source water;
- For private well systems, ensure that the system meets the Canadian standards for drinking water;
- If using a private well, cistern or septic system, ensure that it meets or exceeds provincial building code standards and maintain the system. Plan to have the water tested and treated to ensure its safety;
- If using an individual filtering system (ex. Brita) ensure that you follow the manufacturer's instructions regarding cleaning and replacement of filters. Failure to maintain the system can cause a build up of contaminants and bacteria that will be released into the water;
- Follow Boil Water Advisories and ensure that you have the equipment to treat your water (ex. Metal pots, kettles without an automatic shut-off and storage containers);
- During Boil Water Advisories, sponge bath children and use boiled or bottled water for drinking, brushing teeth, washing dishes and making formula;
- If storing water for emergencies, bottles should be well sealed and kept in a cool, dark area. Water should be replaced at least once a year. If water looks cloudy, smells mouldy or has changed since storing it should not be consumed;
- For chlorinated water, allow the water to sit in an open container for at least 15 minutes to remove the smell and taste. Refrigerate a pitcher of tap water overnight for drinking. Add mint, lemon or other mild flavourings to cover the taste of chlorine;
- If using bottled water, be aware of the source of the water and the filtration/treatment process. Contact the company for information;
- If using bottled water for infant formula, the water should still be boiled since it is not sterilized and can still contain bacteria or contaminants. If you are unable to boil water it is recommended that you use sterilized liquid formula or use fresh, safe (filtered or treated) room temperature water to make one serving ( World Health Organization, 2007).

**For more information contact your local Health Unit/Centre, public works department or Environment Canada.**



# Water: Breastfeeding

*When the baby arrives he/she is born into the centre of the circle...At the beginning of their walk here on earth, the most important nurturing, nourishing protection that they need is Do-Do-Sha-Bo (Breastmilk). The mother shelters and protects the baby with her breastmilk (Pemberton and Kinoshameg, 1995).*

Breast milk is considered the best food for an infant. Although science has shown that contaminants can cross from the mother to her child through breastmilk, the long-term benefits of breastfeeding are felt to outweigh the risk. Contaminants including heavy metals, medications, nicotine, brominated flame retardants, and pesticides have been found in breastmilk. The health affects associated with these contaminants include low birth weights, developmental, reproductive and respiratory problems.

## First Nation Families

The number of First Nation women who breastfeed has steadily increased over the last decade with almost 50% of mother's breastfeeding for at least 6 months.

### What Can Families Do?

- All family members should encourage and support the breastfeeding mother. This includes providing home support, a comforting and stress free environment and caring for the mother's needs;
- Pregnant mothers should seek help from community workers prior to the birth. They should also seek out additional resources such as books, support groups, online websites and so forth that can help with breastfeeding.

**For more information contact your local health centre/unit, parenting program, Health Canada or a breastfeeding resource centre such as La Leche League.**



# Water: Water Quality

Contaminants from industry, forestry, farming and residential waste affect the health of the fish population. The most common contaminant found in fish is heavy metals like methyl mercury. The health affects linked to fish contamination include birth defects, reproductive and development problems.

Being aware of fish consumption advisories particularly in the areas where you fish, will help protect your children from contamination.

## First Nation Families

First Nation people have a special relationship with the environment which includes traditional hunting and fishing practices. These practices include the consumption of the whole fish which includes the fatty portions that store the contaminants. This reliance on fish as a food source can expose children to higher than recommended portions of contaminated fish.

*In the Anishinabek community, they don't just eat the muscle of the fish, they eat the whole fish. The consumption guidelines are based on the high back meat. The contaminants are stored and concentrated in the belly area. Whole fish studies are needed.*

~ Ed Desson, 2007

## What Can Families Do?

- Know what advisories are in place for the areas where you fish. Contact your local health center or Ministry of Natural Resources office for information;
- Consume only the high back meat of fish;
- Women and children may need to eliminate or reduce the amount of fish consumed, based on information in local advisories;
- Advocate for source water and habitat protection to decrease and improve the health of the fish population;
- Working in partnership with harvesters, First Nations should develop and implement dumping policies for the appropriate and safe disposal of fish remains;
- Dispose of all household waste properly to limit water contamination.

**For more information contact your local Ministry of Natural Resources office and Health Unit/Centre.**







*Anishnabek*

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meilleur départ**

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