



### Some harmful substances in wood smoke are:

- PM10 (fine particulate matter less than 10 micrometers) - can be inhaled deep into the lungs, sometimes leading to serious respiratory problems.
  - Carbon monoxide - reduces the blood's ability to supply oxygen to the body. At higher levels it causes fatigue, headaches, nausea, dizziness, confusion and even death.
  - Oxides of nitrogen - can cause lung infections. In particular, nitrogen dioxide causes shortness of breath and irritates the upper airways, especially in people with lung diseases (emphysema and asthma).
  - Hydrocarbons - can cause permanent lung damage.
  - Volatile organic compounds - can cause respiratory irritation and serious illness. Some VOC's such as benzene are carcinogenic.
  - Formaldehyde - can cause coughing, headaches, eye irritation and asthma.
  - Polycyclic aromatic hydrocarbons, dioxins, furans - prolonged exposure poses a cancer risk.
  - Acrolein - can cause eye and respiratory tract irritation.
- \* Wood smoke may smell nice and add a cozy feel to your home, but there are negative side effects. To reduce your exposure, buy the most efficient woodstove possible.

## Revelstoke Eco-Fact Sheet

# Smarter Wood Burning

## Wood Smoke in Revelstoke

Wood smoke is a significant source of air pollution in Revelstoke. Research has identified more than 100 different toxic substances in wood smoke (see sidebar). Many of these substances are proven to be cancer causing. However, the greatest concern comes from the fine particulates.

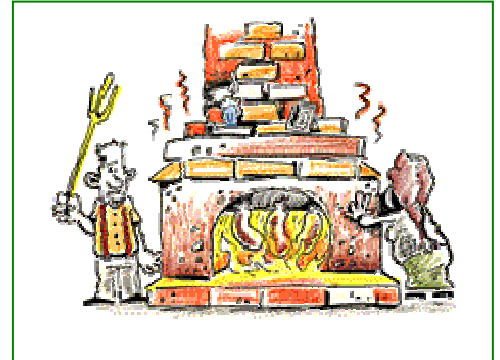
Fine particulates consist of a mixture of microscopic particles. At their largest, they are 10 micrometers in diameter (PM10), about the size of bacteria. PM10 is often composed of harmful substances and has been declared a toxic substance under the *Canadian Environmental Protection Act*. Once inhaled, the finest particles collect in the lungs and can remain there for months.

Medical studies indicate that PM10 and smaller, are associated with a variety of health effects. Elderly people and those with heart or lung disease are particularly sensitive to air pollutants. Children and active adults are also at risk because they typically spend more time outdoors and children tend to be more sensitive than adults because they breathe faster.

Monitoring of fine particulates in Revelstoke has shown that PM10 emissions do exceed the levels where health effects can be expected, in some years up to 40% of the time!

While wood smoke is one of the major contributors to poor air quality in Revelstoke, there are other significant contributors-locomotives, two-stroke recreational vehicles, gas powered lawn care equipment, chainsaws, brush burning, forest fires, dust from roads, and wind storms. With the exception of severe forest fire conditions, February and March are the worst months, when weather conditions can trap smoke in our valley.

Wood smoke in Revelstoke comes from a number of sources; industrial, residential, and forest fires. The District Energy Project and the phasing out of the Downie burner will reduce the amount of wood



smoke. As well, municipal by-laws regulate open-air burning to reduce smoke emissions in Revelstoke.

If you burn wood, you can reduce the amount of smoke that your wood stove, fireplace, or furnace produces. If you watch wood burn, you will see flames appear over only a portion of the log, while smoke rises from different areas. This smoke is a mix of particulates and unburned compounds that are sent up the chimney and into the atmosphere. Increasing the amount of air will reduce the volume of these unburned compounds and make your fire cleaner, and produce more heat from the same amount of wood.

### ***DID YOU KNOW?***

*An energy efficient wood stove reduces the emissions released into the air.*

*A woodstove with a glass front for additional radiant heat to be enjoyed.*

*A thermostat on your stove pipe can tell you if your woodstove is burning efficiently. A hot chimney means a good burn and less creosote build up.*

*Pellet stoves are extremely efficient and release the least amounts of pollutants.*

*Revelstoke monitors air quality at 2 locations. Recently new filters have been added so that emissions of smaller particulate matter can be monitored.*

# Cleaner, Safer & More Efficient Wood Heating

## 1. Reduce your heating needs.

- Make your house energy efficient by improving insulation and sealing leaks.
- Put on a sweater and lower the daytime temperature of your home by 2° Celsius.
- Let your house cool another 5° C at night and when you are away from home.

## 2. Use the right appliance.

- When buying a wood-burning appliance, Check the resources in the sidebar and talk to a wood-heating expert. For maximum efficiency buy what meets your wood-heating objectives and is suited to the size of your home.
- Buy high-efficiency appliances that are certified as low emission by the Canadian Standards Association (CSA). They emit up to 90% less particulates, and are up to 20% more fuel efficient.
- Consider a pellet stove. They are extremely efficient. Rough Country Marine has information on them.
- Have your system installed professionally, and regularly cleaned.

## 3. Burn the right wood.

- Burn clean wood that has been seasoned for at least 6 months.
- Burning wet wood creates more smoke, and produces less heat.

Cut wood into lengths 5-8 cm shorter than your fire chamber and split it into pieces 10–15 cm in diameter.

- Never burn garbage, wood that has been pressure-treated, or painted. These can release toxic substances when burned.

## 4. Use good burning techniques.

- Burn small, hot fires; never allow a fire to smolder.
- Many wood burning appliances require special techniques - always follow the manufacturer's instructions. Attend a local Burn It Smart workshop.
- Control the air supply. The amount of oxygen determines how completely the fuel is burned. When starting a fire or adding wood, fresh fuel requires more oxygen for the first 10 minutes. Once the wood is well charred, it requires less air.
- Monitor how well your fire is burning by checking both the fire and what is rising out of your chimney. The fire should burn brightly.
- Smoke rising from the wood should burn over top of the main fire with bright yellow/blue flames. Dull, steady flames indicate a lack of oxygen and incomplete combustion.
- A cloud of smoke rising from your chimney in the middle of a burn indicates that your fire does not have enough air. Some smoke will be visible at start up and possibly during reloading, but for the remainder of the burn it should be almost invisible.

### For Safety Sake

- install smoke alarms and carbon monoxide detectors
- minimize creosote deposits by burning small, hot fires and using only dry wood
- keep a fire extinguisher nearby
- have your stove properly installed, inspected and maintained on a regular basis
- always check with your insurance company before installing any wood stove

## For More Information

■ <http://www.northcolumbia.org/> for more links and also check out the NCES binders on the reference shelf at the Revelstoke Public Library.

■ <http://www.woodheat.org> for general non-commercial information on residential wood-heating.

■ <http://www.wetbc.ca> for BC specific information on the *Wood Energy Technical Training (WETT) Program*, several fact sheets and links including the national site where you can search for local WETT certified technicians.

■ *A Guide to Residential Wood Heating* (2002) by Canada Mortgage and Housing Corp. and Natural Resources Canada is an excellent resource. Find it in the NCES binders, order it from the library, or phone 1-800-387-2000 for your own free copy. You can also link to an on-line version from the *Burn-It-Smart* website.

■ Check the Revelstoke Library for *Wood stoves burn hot, burn clean* (1996) a video produced by the BC Air Resources Branch and ask for help ordering in *The woodburner's companion : practical ways of heating with wood* (2000) by Dirk Thomas.

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