

Airshed Management Planning in Williams Lake

- A community initiative to improve air quality -

What is Airshed Management Planning?

Airshed Management Planning in Williams Lake is a process aimed at improving air quality. It is overseen by a multi-stakeholder committee and the goal is to tackle virtually all sources of air pollution from residential burning to large industrial sources.

Activities under the process include:

- additional monitoring of pollution sources;
- identifying present air pollution problems;
- producing a Management Plan to identify short and long term steps for improving air quality in the Airshed;
- implementing these management solutions while maintaining jobs.

Is the present air quality hazardous to people's health?

When asked the question, *“During the past 12 months, do you think any indoor or outdoor pollution issues have affected your health?”* one out of five Central Cariboo residents responded “Yes” to a Community Health Survey conducted in the winter of 1998. Of these individuals, 56% said they thought outdoor air quality was the cause.

- Our air quality in needs improvement. In fact, in 1999 Williams Lake recorded the fourth highest level of fine particulate air pollution in the province out of 27 communities where continuous monitoring is conducted. The levels recorded are a concern from a public health perspective. While air quality is considerably better in Williams Lake as a result of the phase-out of the wood waste burners, there is room for improvement. Good planning now will help maintain and improve our air quality in the future.
- Health authorities feel that the following health outcomes are linked to poor air quality:
 - increases in hospitalizations and emergency room visits due to asthma, chronic bronchitis, emphysema, other respiratory conditions; as well as heart conditions;
 - days absent from work or school and days of restricted activity;
 - decreases in lung function of children and asthmatic adults;
 - reduced lung function and capacity in children; and
 - increases in total mortality, as well as in mortality from respiratory or cardiac disease.
- Additional information on health effects can be found further on in this brochure.



Why is Airshed Management Planning important for Williams Lake?

Air quality problems affecting the physical and economic health of Williams Lake are of concern to residents, local environmental societies, health professionals, local government, the business community and industry. The Airshed Management Planning process, which was officially launched in December 2000, will address community air pollution concerns related to the health of local residents, and to the future economic development of the region.

- The Plan will address the region's health concerns by measuring all inhalable particulates on a continuous basis, by identifying the sources of air pollutants and by reducing overall particulate levels in the community.
- On the economic development front, the reduction of air pollution will result in an improvement in the region's air quality. This improvement is essential in order to encourage further economic development, and to promote the region as a healthy area for persons entering retirement.

What is the Williams Lake Airshed?

The Williams Lake Airshed refers to the mass of air contained in Williams Lake and the immediate surrounding communities of the Cariboo Regional District, and particularly that air mass contained and affected by the natural topographical features of the Williams Lake valley. The Ministry of Environment, Lands and Parks has defined this area on a map provided on the back page of this brochure. These boundaries are not all encompassing as there will be times when meteorological conditions will transport pollutants from outside the airshed into the Williams Lake area (e.g. smoke from forest fires).

Who will do the Airshed Management Plan and how long will it take?

- The community of Williams Lake has a committee known as the Air Quality Roundtable that guides the development of the Airshed Management Plan.
- The committee is composed of a cross section of the community and includes representatives from local industry, local and provincial government, regional and community health authorities, environmental groups, and concerned citizens groups. The City of Williams Lake presently chairs the committee.
- Development and implementation of the Plan will take approximately five years, although it is anticipated that some plan recommendations may take longer to implement.
- The committee has a detailed outline of how the process will proceed.



How will the Airshed Management Plan address sources of pollution that are deemed to be a problem?

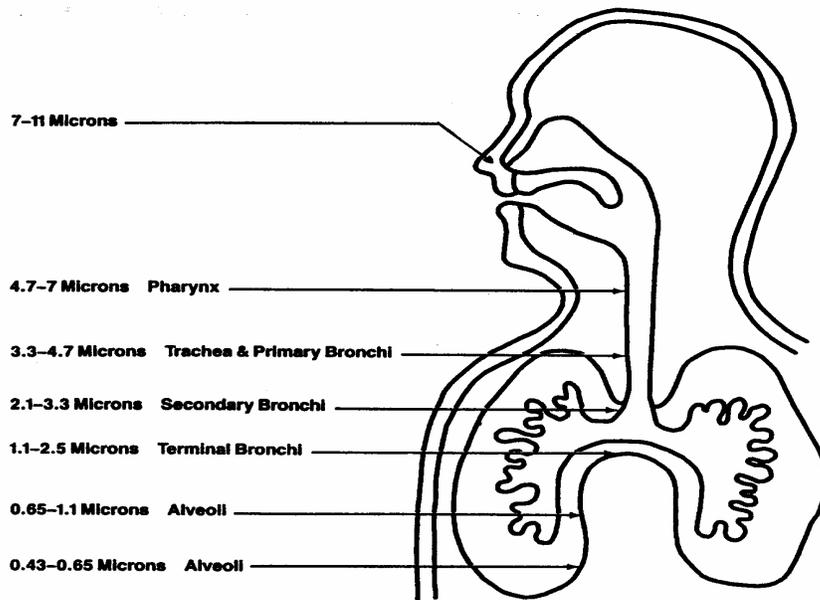
Once air quality monitoring and assessment work has identified emission sources and their relative contributions to poor air quality, the goal will be to:

- ensure that identified contributing sources are using the best technology available to treat air emissions;
- use Pollution Prevention Plans to systematically reduce point and non-point (diffuse) sources of industrial pollution;
- implement dust control measures at strategic locations in the airshed;
- institute better regulation of all types of burning; and
- suggest innovative approaches to reducing emissions from all types of motor vehicles.

What is suspended particulate matter and PM₁₀?

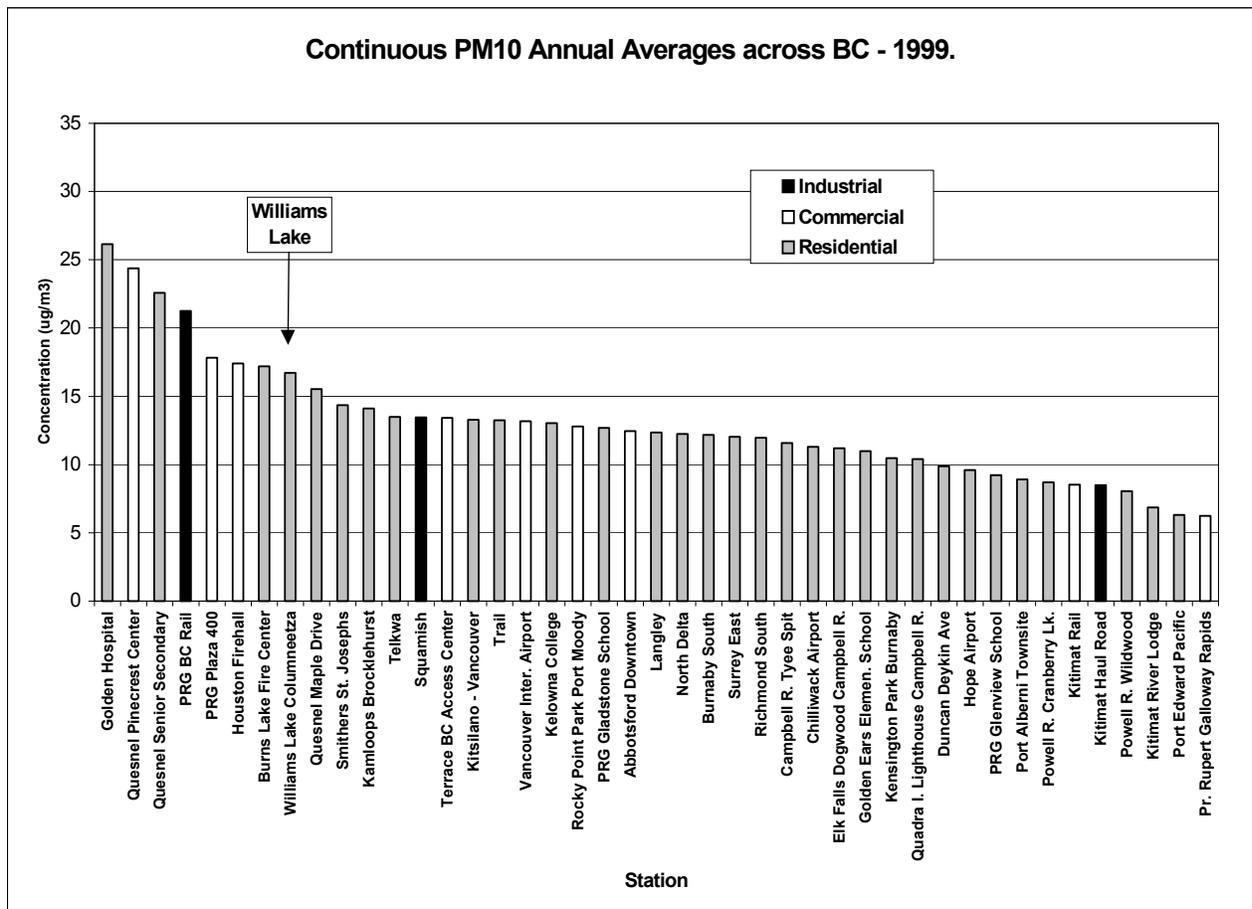
- Suspended particulate matter refers to airborne particles that range in size from 0.001 micrometers (μm) to 100 μm (the period at the end of this sentence is about 500 μm in diameter). These particles vary in chemical composition, size and shape, depending on their origin.
- PM₁₀ refers to suspended particulate matter less than 10 μm in diameter. Particles larger than 10 μm , such as flyash, settle out close to the emission source relatively soon after being emitted. Particles smaller than 10 μm (PM₁₀) can remain suspended in the atmosphere for long periods of time and travel great distances from the source.
- While large suspended particulates, such as flyash, may cause a nuisance or aesthetic problem, fine particulates (less than PM₁₀) have the greatest effect on human health. Recent health and medical studies have shown that PM₁₀ has extensive and serious human health impacts (Vedal, 1995) – see page 6 for more information on health. There is also evidence suggesting that the smaller the particle, the greater the health risks as these tiny particles are inhaled deeply into the lung cavity.





Particle size deposition for particles of varying sizes.

- PM_{10} is further divided into a coarse and fine fraction, as particles in each fraction generally differ in chemical composition, source and behavior in the air.
 - The fine fraction of PM_{10} includes particles 2.5 micrometers (μm) in diameter and less. This size fraction is generally composed mainly of secondary particulates, i.e. particles formed from physical and chemical reactions involving gases such as oxides of nitrogen, sulphur and ammonia, and volatile organic compounds (VOCs) that are emitted into the air.
 - Particles less than 2.5 μm are thought to have even greater health impacts than coarser particles because of their ability to penetrate to the deepest regions of our lungs. These particles are also very efficient at scattering/absorbing light and are responsible for regional haze and smog.
 - The coarse fraction of PM_{10} includes particles between 2.5 and 10 micrometers in diameter. This is the size fraction most often associated with natural sources such as soil particles and fibres.
- The following figure shows how PM_{10} monitoring sites in Williams Lake compare to other monitoring locations in the province in 1999.



What are the main sources of air pollutants that contribute to poor air quality in Williams Lake?

- It has been determined that the main thing that drives poor air quality episodes in the Williams Lake area is PM₁₀.
- There are a wide variety of natural and anthropogenic (man-made) sources of PM₁₀ in the Williams Lake area. Some sources include wind blown dust, pollens and spores, wind blown agricultural soils, road and construction dust, industrial processes and energy systems, sawmill cyclones, wild fires, prescribed burns, open burning, back yard burning, home and commercial heating (primarily wood stoves), automobile/truck and train emissions (especially diesel), quarrying activities, etc.
- A good air quality indicator is regional visibility. The presence of fine particles in the air reduces the distance at which we can see the colour, clarity and contrast of far away objects because the particles in the atmosphere scatter and absorb light. For instance, when we notice a blue or brown haze in the airshed, chances are that PM₁₀ levels are building and air quality is less than perfect.



What are the health effects of PM₁₀

- A University of BC professor and BC Lung Association researcher, Dr. Sverre Vedal, conducted a study entitled *Health Effects of Inhalable Particles: Implications for British Columbia*. Vedal's study points out that "While air pollution is composed of different types of pollutants, fine particulates (or inhalable particles) are considered a greater health hazard than some higher profile pollutants such as ground level ozone, sulphur dioxide and carbon monoxide." Studies suggest that fine particulates and sulphate together are more potent contributors to increased deaths and burden of illness than are the larger particulates.
- Dr. Vedal's study revealed that in BC, fine particulates contribute annually to at least 82 deaths (compared to about 570 deaths reported by the Provincial Health Officer as attributable to breathing second hand tobacco smoke).
- Of the premature deaths attributed to fine particulates, more than 3 out of 4 are estimated to occur in smaller population centers (outside the Greater Vancouver, Capital and Nanaimo Regional Districts). Mortality is, of course, only one measure of negative health outcomes. Other health problems associated with PM₁₀ were discussed on page 1. These undesirable health outcomes attributable to particulates are also proportionately higher in the smaller population centers.
- Further, it has been argued that the health effects of particulate matter air pollution reported in studies represent only the 'tip of the iceberg'. These more obvious effects could be only the most visible outcomes of a much greater burden of illness in the general population that, although less critical, may be impairing or have the potential for future impairment of quality of life (from *Ambient Particulate Matter: An Overview*).
- There appears to be a threshold level for exposure to particulates. Below certain levels of particulate matter in the air, no adverse health effects have been demonstrated. The currently accepted level of particulates (PM₁₀) below which no adverse health effects have been demonstrated is 25 ug/m³ (daily average).

What can the individual homeowner do to help improve air quality?

Many emissions are created by our own lifestyle choices, such as driving a poorly maintained vehicle or using an old smoky wood stove. Here are some tips on how you can reduce sources of PM₁₀ and other pollutants in Williams Lake.

- Carpool, better yet, walk or ride a bike. Leaving the car at home will also mean less road dust kicked up into the air from motorists. Make sure your car is well tuned and does not burn oil. When purchasing a vehicle, look for fuel efficiency and low emissions.



- If you burn wood for heating your home or business buy an efficient, CSA or EPA emissions certified wood stove that is installed and operated correctly. New emissions certified wood stoves can reduce smoke emissions by 90%. Also, overloading your stove, starving the fire of air or burning wet or green wood can cause a lot of extra smoke. Use only dry, seasoned, split firewood that is properly stored. Convert your wood burning fireplaces to natural gas. Traditional fireplaces do not have any emission control devices to protect the air.
- Be conscious of daily air quality. If there is a temperature inversion or calm winds, don't contribute to a possible air quality episode by burning or unnecessary driving.
- Instead of burning your leaves, dead grass or clippings, start a backyard compost. Also, don't burn your garbage in burn barrels as this releases hazardous pollutants into the air.



For more information, please contact:

Pollution Prevention
 Ministry of Environment, Lands and Parks
 400-640 Borland Street
 Williams Lake, BC
 V2G 4T1
 Telephone: (250) 398-4530

Chair, Williams Lake Air Quality Roundtable
 c/o City of Williams Lake
 450 Mart Street
 Williams Lake, BC
 V2G 1N3
 Telephone: (250) 392-2311

Williams Lake Air Quality Roundtable Membership

City of Williams Lake
 W L & District Chamber of Commerce
 TransCanada - Williams Lake Power Plant
 Lignum Ltd
 West Fraser Mills Ltd
 Caribou Road Services

Cariboo Regional District
 Williams Lake Environmental Society
 Williams Lake Construction Association
 Weldwood of Canada Ltd
 Riverside Forest Products Ltd

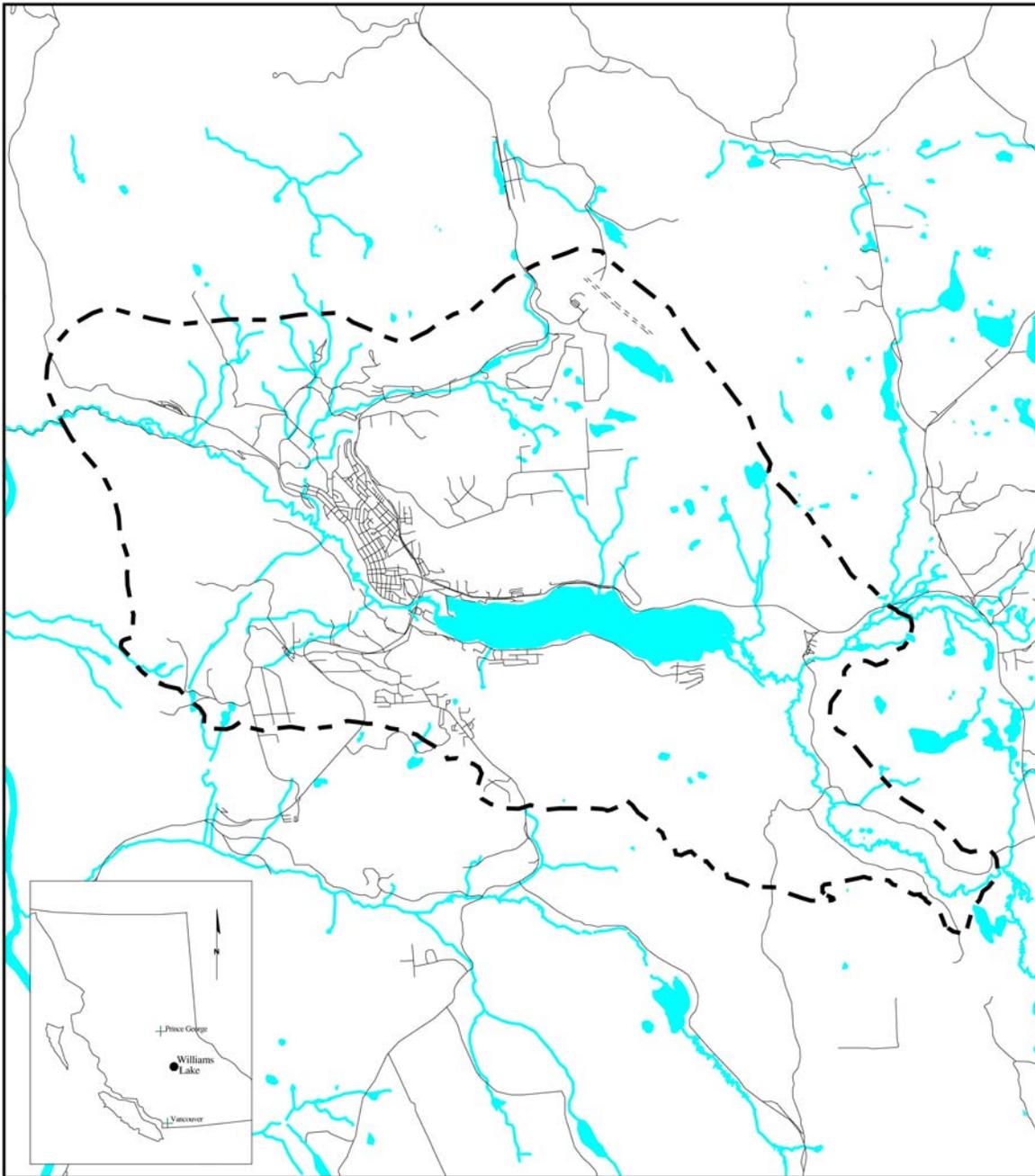
Technical Support

Ministry of Environment, Lands & Parks
 Ministry of Transportation and Highways

Ministry of Forests
 Cariboo Community Health Services Society

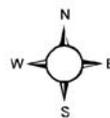
A number of pamphlets are available to the public which provide information on various air pollutants and what you can do to help clean the air in your community. Please contact the Ministry of Environment, Lands and Parks or the Cariboo Health Unit.

Williams Lake Airshed



Produced by the Information Technology Section
Ministry of Environment, Lands and Parks
Williams Lake, British Columbia

Projection is standard Albers, NAD83, Spheroid GRS1980
1st Standard parallel 50 00 00N
2nd Standard parallel 58 30 00N
Central Meridian 126 00 00W
Latitude of projection origin is 45 00 00N



Map not to scale

Legend

-  Airshed Boundary
-  Primary Roads
-  Airport

