



bulkley valley - lakes district
airshed management society

COMMUNITY ACTION PLAN *for* **CLEAN AIR**

A five-year strategy

APPENDICES

LAST UPDATE: JUNE 11, 2006

Appendices

Appendix A

Abbreviations and Glossary

AMP	Airshed Management Plan
BFP	Babine Forest Products
BMP	Best Management Practice
BVLD	Bulkley Valley-Lakes District
CanFor	Canadian Forest Products
CFDC	Community Futures Development Corporation
CSA	Canadian Standards Association
CWD	Coarse Woody Debris
CWG	Community Working Group
DM	District Manager (Ministry of Forests)
DLFP	Decker Lake Forest Products
EPA	Environmental Protection Agency
HFP	Houston Forest Products
MOF	British Columbia Ministry of Forests
MOTH	British Columbia Ministry of Transportation and Highways
PED	Potential Episode Day
PIR	Pacific Inland Resources
PLC	Programmable Logic Controller
RWG	Regional Working Group

TSA **Timber Supply Area**

WETBC Wood Energy Technicians of British Columbia

WLAP British Columbia Ministry of Water, Land and Air Protection

AIR QUALITY ADVISORY	An advisory issued by the Ministry of Water, Land and Air Protection alerting the public that air quality is degraded.
AIR QUALITY EPISODE	A period of degraded air quality (due to higher than normal levels of pollution), due to a combination of emissions, topography and meteorology.
AIR QUALITY INCIDENT	See Air Quality Episode.
AIRSHED	A geographic area that, because of emissions, topography and meteorology typically experiences similar air quality.
AMBIENT	Environmental or surrounding conditions.
ASTHMA	A condition often of allergic origin that is marked by continuous or spastic laboured breathing accompanied by wheezing, by a sense of constriction in the chest, and often by attacks of coughing or gasping.
ASTHMATIC	A person who is sensitized to allergens and with hyper-responsive airways. There is genetic predisposition, but non-genetically related asthma occurs also in adults.
ATMOSPHERIC MIXING	Movement of air that results in mixing. Typically caused by atmospheric instability.
ATMOSPHERIC PROFILE	A chart or graph which shows meteorological variables (temperature, wind, etc.) from the surface up into the atmosphere at one location.
BEEHIVE BURNER	A beehive burner is a large conical steel structure used to burn wood residue. The beehive burner contains a series of dampers, air ducts, fans and various controls. Wood residue is fed into the structure near 2/3 from the base.
BENCHMARK	A standard by which something can be measured or judged.
BEST MANAGEMENT PRACTICES	A practice or combination of practices that are determined to be the most effective, practical means of reducing the amount of pollution generated by a source to a level compatible with environmental quality goals.
BIOMASS	Biomass refers strictly speaking to the total weight of all the living things in an ecosystem. However, it has come to refer to the amount of plant and crop material that could be produced in an ecosystem for making biofuels and other raw materials used in industry, for example.
BROADCAST	Debris is burned as is on the ground as opposed to being piled into distinct piles.

BURNING	
BRONCHITIS	Acute or chronic inflammation of the bronchial tubes.
BURN BAN	A suspension of the exemption under the Waste Management Act of the requirement to have a permit or approval to discharge waste (therefore, no burning under the Open Burning Smoke Control Regulation is allowed). This means that only operators with a valid permit or approval for open burning can do so during a burn ban.
BURN REFERENCE NUMBER	Ministry of Forests require residents planning a fire larger than a typical backyard burning pile to obtain a burn reference number by calling 1-888-797-1717. This number ensures that MOF can track every person planning to burn debris.
CALPUFF	A computer model that uses modeled meteorology from CALMET along with inputted emission information from sources to produce an estimate of air quality at numerous locations throughout a defined area and period of time.
CALMET	A computer model that uses meteorological monitoring data, land use data and terrain data to develop a 3-dimensional estimate of meteorological conditions at numerous locations over a defined area and period of time.
CANADIAN STANDARDS ASSOCIATION	A not-for-profit, membership-based association serving business, industry, government and consumers in Canada and the global marketplace. It works in Canada and around the world to develop standards that address needs, such as enhancing public safety and health.
CATEGORY 1 & 2 BURNS	Ministry of Forests defines small open fires/backyard burning (reference number not required) as category 1 & 2 burns. Note, a burn reference number is not required.
CATEGORY 3 – 6 BURNS	Ministry of Forests defines industrial and agricultural burning as category 3-6 burns. Note, a burn reference number is required.
CATEGORY 7 & 8 BURNS	Ministry of Forests defines open fires for resource management purposes as category 7 & 8 burns. Note, a burn reference number is required.
CIRCULATORY DISEASE	Disease caused by the normal flow of blood through the body being restricted or blocked as a result of arterial plaque. This may cause damage to the heart, brain, kidneys or other organs and tissues.
CLOUD CEILING	The lowest broken or overcast layer of a cloud. Usually the term will only be used if clouds occupy more than %50 of the visible sky at a particular height. If a cloud ceiling is low, chances are the sky is drab and visibility for small aircraft may be reduced.

COARSE WOODY DEBRIS	Coarse woody debris is dead woody material, in various stages of decomposition, located above the soil, larger than 7.5 cm in diameter (or equivalent cross-section) at the crossing point, which is not self-supporting. Trees and stumps (intact in ground) are considered self-supporting.
COMBUSTIBLE MATERIAL	Material which have the potential to burn.
COGENERATION	Simultaneous production of heat energy and electrical or mechanical power from the same fuel in the same facility. The use of waste heat (as in steam) from an industrial process to produce electricity, or the use of steam from electric power generation as a heating source are examples of cogeneration.
COMMUNITY WORKING GROUP	Three groups (Lakes, Morice and Bulkley (with Kispiox)) of stakeholders developed for the BVLDAMP with a focus on local air quality issues.
DAMPING	The act of starving a fire of air, thereby lengthening the time it takes for wood to burn. This decreases the efficiency of the burn, causing incomplete combustion (burning) which results in smoke (smoke is wasted, unburned fuel).
DIABETES (TYPE II)	Mild form of diabetes mellitus that develops gradually in adults; can be precipitated (made to occur sooner or faster) by obesity, severe stress, menopause or other factors; can usually be controlled by diet and hypoglycemic agents without injections of insulin.
DIOXINS	Any in a family of over 200 chlorinated organic chemicals (all heterocyclic hydrocarbons). Dioxins are produced when chlorinated materials such as plastics are burned. Dioxins are known to cause skin diseases (chloracne), birth defects, miscarriages, and cancer.
EPA EMISSION CERTIFIED APPLIANCE	A wood-burning appliance which has met the low-emission standards set by the United States Environmental Protection Agency.
EMISSION INVENTORY	Involves qualifying and quantifying the emissions in an area which contribute to ambient air quality. Qualifying entails determining what sources exist that emit the pollutant of interest, and quantifying involves determining how much each source emits and when.
EMISSION	A substance discharged into the environment.
EPISODE	See Air Quality Episode.
EPISODE SCENARIO	Modelled air quality episode.

FALL AND BURN	Hand felling, hand piling, and burning individual trees or patches of trees for the purpose of bark beetle control.
FINE PARTICULATE(S)	Tiny solid or liquid particles that come in many shapes and sizes and from many sources, both natural and human-caused. Fine particulates 10 micrometer or less in diameter are called PM10, and those 2.5 micrometers or less in diameter are called PM2.5 (PM stands for particulate matter),
FORECAST LOOPS	An animated prediction model which plays repeatedly.
FORECAST VENTING	See Venting Index Forecast.
HAND BUCKING	Trimming tops and branches from harvested trees, and cutting that tree to ideal lengths. This can be done using a chainsaw or handsaw.
HOG SYSTEM	Industrial and commercial facilities incinerate 'Hog' to power their facilities. Hog is the unusable waste generated by saw-milling logs and consists of bark and sawdust. A hog system grinds and chops this material from larger material and collects/prepares it for transport from the sawmill to the end user.
HORMONAL SYSTEM	The system of glands that secrete (produce) hormones.
IMMUNE SYSTEM	A collection of cells and proteins that work to protect the body from potentially harmful, infectious microorganisms (microscopic life-forms), such as bacteria, viruses and fungi.
INSECT HAZARD ABATEMENT	Efforts that reduce the risk of insect damage spreading. Fall and Burn is one example of this.
LANDING	An area of concentrated skidding activity, where logs are dropped to be 'Hand Bucked' or 'Machine Processed'. Skidding is where machines drag logs to a centralized point (landing) or roadside.
LICENSEE	Refers to a holder of a Major License under the Forest Act.
METEOGRAMS	A numerical weather forecast in which the output displays temperature (surface and at 850 hPa), mean-sea level pressure, wind and precipitation.
METEOROLOGY	The study of the weather, as well as the atmosphere and atmospheric phenomena including the atmosphere's interaction with the earth's surface, oceans, and life in general.
MODEL	A computer program used to estimate or simulate a real world situation.
PARTICULATE MATTER	A criteria air pollutant. Particulate matter includes dust, soot and other tiny bits of solid materials that are released into and move around in the air. Particulates are produced by many sources, including the burning of wood, diesel fuels by trucks and buses, incineration of garbage, mixing and application of fertilizers and pesticides, road construction, industrial processes such as steel making, mining operations, agricultural burning (field and slash burning), and operation of fireplaces and woodstoves among others. Fine particulate are a subset of particulate matter

PHENOMENA	The plural of phenomenon, an occurrence, circumstance, or fact that is perceptible by the senses.
PILING	Placing logging debris into specific vertical piles for the purpose of burning the debris more efficiently or to reduce the area of ground affected by the debris.
PM2.5	Particulate matter with a diameter of less than 2.5 micrometers (µm). One micrometer is one millionth of a metre. PM2.5 is included in fine particulate, and is a subset of PM10 (when measuring PM10, it includes PM2.5). PM2.5 is typically associated with combustion sources (smoke) and is more closely related to adverse health effects than larger particles.
PM10	Particulate matter with a diameter of less than 10 micrometers (µm). One micrometer is one millionth of a metre. PM10 is included in fine particulate and includes PM2.5 (when measuring PM10, it includes PM2.5). The larger particles in PM10 are typically associated with crustal (ie. dust) sources.
POTENTIAL EPISODE DAY	A day where, based on meteorological variables (still air, poor venting) the potential for an air quality episode exists, dependent on emissions.
PROGRAMMABLE LOGIC CONTROLLER (PLC)	A solid-state control system that has a user-programmable memory for storage of instructions to implement specific functions such as I/O control, logic, timing, counting, report generation, communication, arithmetic, and data file manipulation. A controller consists of a central processor, input/output interface, and memory. A controller is designed as an industrial control system.
REFORESTATION	Replanting of trees on land that has recently been harvested for trees (logged).
REGIONAL WORKING GROUP	Made up of representatives from Community Working Groups and others, developed for the BVLDAMP with a focus on airshed-wide air quality issues.
RESIDUAL DEBRIS	Tree limbs and tops, rotten wood, etc.
RESPIRATORY DISEASE	Describes a number of problems that affect the organs of the respiratory system. The respiratory system is made up of the organs that are involved in breathing. These include the nose, throat, larynx, trachea, and lungs, which are made up of the bronchi, and arterioles.
ROADSIDE BASED	Refers to forest harvest debris piles based located near or on a roadside. Roadside based debris piles are smaller but greater in number than piles concentrated at a landing.
SILVICULTURE PRESCRIPTION	A pre-harvest paper document that outlines factors to consider during and after logging that will achieve a new plantation when complete.
SITE PREPARATION TREATMENTS	Sometimes post-harvest ground is not plantable. Either the ground has too much debris, is too wet, or the soils are too compact. A Site Preparation treatment will target the problem to create a more favorable planting and growing environment for the seedling.
SMOKE DISPERSION	The ability of the atmosphere to dilute smoke through mixing and transport.
SMOKE HAZARD	Reduction of hazard due to smoke.

ABATEMENT

STACK EMISSIONS	Substances coming out of a stack.
TIMBER SUPPLY AREA	An integrated resource management unit established in accordance with the Forest Act.
TIER 1 (BEEHIVE) BURNER	A Tier 1 burner is one that is 5 km or less from a populated area of 500 or more people.
TIER 2 (BEEHIVE) BURNER	A Tier 2 burner is defined as other than a Tier 1 burner.
TOPOGRAPHY	The terrain of an area including position and elevation information for surface features.
VALUE ADDED ALTERNATIVE	A solution or alternative to any situation which has direct or indirect 'value' of any kind. Value could be in the form of alternate cash generation (ie. use of waste as or to create a useable product), waste reduction or pollution prevention.
VENTING	An atmospheric phenomenon (resulting from a combination of wind and the atmosphere's ability to lift air), which allows for smoke dispersion.
VENTING INDEX FORECAST	A numerical weather forecast in which the result is a scale from 0-99, consisting of three categories (good, fair and poor), which describes venting conditions. Poor venting exists when the venting index forecast is from 0-33, fair venting exist when the venting index forecast is from 34-54 and good venting conditions exist when the venting index forecast is from 55-99.
VISUAL BLIGHT	Something which Impairs or destroys vision.
WELL BEHAVED	In this plan, refers to a realistic outcome produced by a numerical weather forecast or weather variables in general.
WINDGRAMS	A numerical weather forecast in which the output is a forecast of wind conditions (speed and direction) up into the atmosphere and foreword into time at one given location.
WOOD STOVE CHANGE OUT PROGRAM	A program in which education and incentives are available to people wanting to trade in a non-EPA emission certified appliance in exchange for a new lower emission (fine particulate) appliance.

Appendix B

Health Effects

Health effects of **fine particulates** were described briefly in Chapter 2. There is a large body of literature on this subject, and the 2 documents cited in Chapter 2 would be a reasonable introduction to these health issues. Both contain references to a variety of research results.

The Pope et al (2002)¹ long term study (12 years) of lung cancer commissioned by the American Cancer Society looked at health vital status variables and cause of death. This ongoing mortality study enrolled 1.2 million adults. It included linking risk factor data for approximately 500 000 adults with air pollution data for metropolitan areas throughout the United States. The combined air quality, health vital status and cause of death data up to the end of 1998, confirmed that each 10 µg/m³ increase in fine particulate air pollution is associated with a 4% increase in all cause mortality, a 6% increase in cardiopulmonary death and an 8% increase in lung cancer deaths (over the course of the study). The conclusion was that long-term exposure to combustion-related fine particulate air pollution is an important environmental risk factor for cardiopulmonary and lung cancer mortality.

The Bates et al (2002)² summary report on air pollution in BC provided commentary on a number of studies aimed at determining the degree to which fine particulates affect human health. The authors cited one study done in Christchurch New Zealand (Particulate Air Pollution and Hospital Admissions in Christchurch New Zealand, McGownan J.A., P.N. Hider, E. Chako, and G.I. Town 2002, in Australia New Zealand Journal of Public Health 26: 23-29) which is of interest in terms of its similarity of emission sources to interior BC communities (mostly wood smoke derived fine particulates). Conclusions in the Christchurch study supported previous researchers' conclusions that there are increases in many measures of illness associated with daily air quality. The Christchurch example showed that for each daily increment of 15 µg/m³ **PM10**, there were statistically significant percentage increases in daily hospital admissions for pneumonia and flu (5.32%), acute respiratory infections (4.53%), all respiratory admissions (3.37%) and cardiac conditions (1.36%).

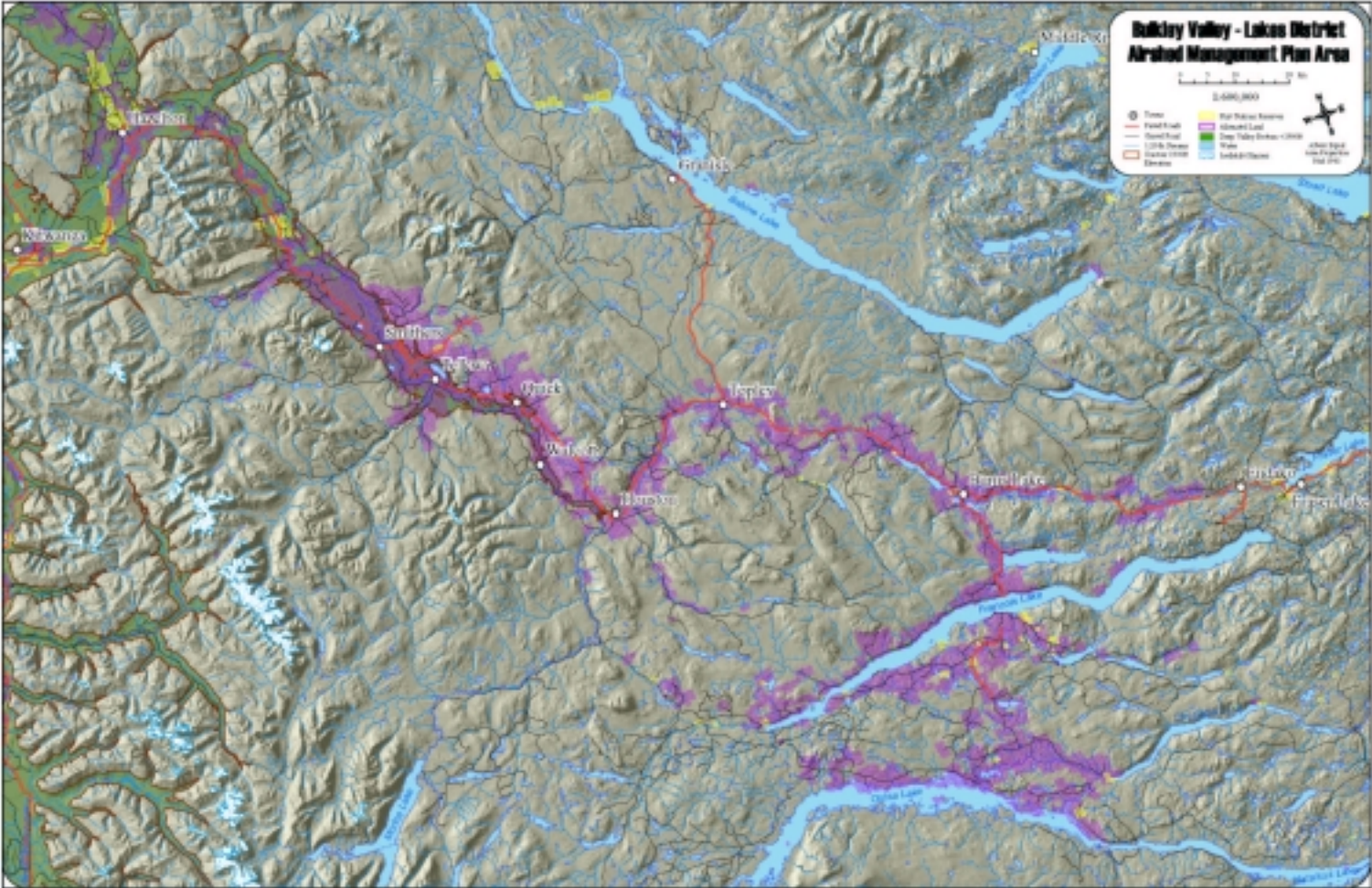
To put this in perspective, **ambient** air quality data for the period of 1997 to 2001³ demonstrate that average annual PM10 concentrations in Bulkley Valley and Lakes Districts range from 13 to 22 µg/m³, while maximum 24 hour averages have ranged from 55 to 187 µg/m³. The data shows that there are often at least 4 smoke related **air quality episodes** per year in the Bulkley Valley and Lakes Districts.

¹ C. Arden Pope III, Richard T. Burnett, Michael J. Thun, Eugenia E. Calle, Daniel Krewski, Kazuhiko Ito, George D. Thurston. 2002. Journal of the American Medical Association Vol. 287 No. 9 1132-1141.

² Dr. D. Bates, Dr. J. Koenig, Dr. M. Brauer, RWDI West Inc. May 2003. Health and Air Quality 2002-Phase 1: Methods for Estimating and Applying Relationships between Air Pollution and Health Effects. Prepared for BC Lung Association.

³ Summarized in Levelton Consultants Ltd., 2002 Air Quality Summary and Assessment for the Bulkley Valley and Lakes District. Prepared for MWLAP, Skeena Region.

Appendix C
Map of the Airshed Planning Area



Appendix D

Summary of Submissions under Annual Clean Air Plan review and Responses

2006 (received as of June 1, 2006)

Description (2006 submissions)	Response
Amend scope to include emissions from potential new sources and develop strategies. i.e. Telkwa Coalbed Gas, Molybdenum Mine, Northwest Premium Meat Co-op (slaughterhouse)	
Amend scope to include emissions from CN rail : diesel emission and coal dust	
Amend scope to include transportation emissions especially Telkwa – Smithers travel corridor.	Can address this as capacity allows – for now are partnering with other organizations as part of Clean Air Day celebrations to promote green commuting.
Replace table 3-1 with more recent data – currently ends in 2002 – could also append subsequent years.	
Amend scope to include agricultural balewrap plastic - many farmers are burning - could be ch.8 or ch.6	Can work with MSW department of MOE and Min. of Agric. to find solutions as well as implement other recommendations of Ch.7.
Revisiting slash burning – focus on reducing quantity of slash to be burned by finding alternatives.	Can make this the focus of the 2006 Burn Operators Forum.
Amend constitution to specifically include action on climate change and energy efficiency in context of community adaptive measures.	
Workplan should focus 70% on improving neighbourhood air quality via space heating emission reductions and 30% all other sources.	
Communications strategy should be updated and refined to include a specific communications plan for general education and neighbourhood air quality specifically.	

2005

Description (2005 submissions)	Response
Refine indicators listed in Table 3-3 – amend definition of Potential Episode Day to include PM _{2.5} >15, add new indicator: 5 days where PM _{2.5} >30, refine indicator for improving air quality as follows “ PED average PM ₁₀ and PM _{2.5} , Non-PED average PM ₁₀ and PM _{2.5} ”	Accepted – see new table 3-3 in 2006 version of Plan
Include new chart showing annual average of PM ₁₀ and 2.5 by community	Information presented as part of Ambient Air Quality Assessment reports and community

Description (2005 submissions)	Response
	presentations; available on website.
Ch. 4 – Resubmission: disagreement with wording of study findings from Prince George on effect of closing down beehive burners on air quality – new wording suggested.	Received –It was determined that wording is acceptable as originally written and changes will not be made. A new case study can replace the PG one with a local example when it becomes available.
Ch. 4 – update to reflect PIR closure of beehive burner; move PIR source to Ch.5	Accepted.
Complete Ch.5 to outline strategies for reducing emissions from NEWPRO	Accepted – see new Ch.5 in 2006 version of Plan
Ch.7 – add local government waste management operations to scope	Accepted with modifications
Ch.8 – add wood furnaces and outdoor boilers to scope	Accepted
Ch.10 – add unpaved “Tier 1” roads to Road dust scope and add BMP document to resources listing.	Not accepted – further consultation with communities needed on long term strategy. In the interim, specific concern on Buck Flats Road can be pursued more effectively through other channels. New listing added.
Ch.11 – Update to reflect new governance structure, workplan and financing	Accepted action – facilitator to draft new chapter for 2006 version.
Appendix E – update summary of co-located air quality and meteorology monitoring stations	Accepted
Addendum – Communications Strategy	Modified – refer to document in Ch.11 and make available upon request to membership.
Addendum – Constitution and Bylaws	Modified – refer to document in Ch.11 and make available upon request to membership.
Appendix F – update to reflect implementation of Forest Harvest Debris chapter re: cross-referencing with Smoke Management Plans.	Accepted with modification – remove Appendix F and accepted recommendation of Burn Operator Forum to include status update in each chapter.
Appendix H – Remove and provide link to provincial woodstove emissions inventory in Ch.8	Accepted.

2004

Description (2004 submissions)	Response
Make sure we follow through on shutdown of beehive burners and suggested we coordinate a market boycott.	Received – boycott strategy is not consistent with our preferred style of building cooperative solutions but it is acknowledged that direct community action to speed up process of shutting down burners can be taken in consultation with mills.
Description of NEWPRO operations for inclusion in Plan.	Accepted.
Update on implementation of strategies from Resource Management Burning Subcommittee.	Accepted.
Disagreement with wording of study findings from Prince George on effect of closing down beehive burners on air quality – new wording suggested.	Received – MOE staff will investigate and if changes to

Description (2004 submissions)	Response
	wording are warranted because statements are misleading then this will be done.
Expand scope of Clean Air Plan to include reduction of greenhouse gases and promotion of energy efficiency.	Accepted with modifications – workplan can include partnering with organizations on projects that have these goals but this is not a primary focus of the Plan at this point. These two goals are co-benefits of many of our air quality improvement strategies but for now we do not want to dilute our efforts.
Letter re: burning of MSMA treated wood in beehive burners	Accepted – not appropriate for AMS to get involved with this issue – refer to regulatory agencies.
Comments on Structure: Pursue society structure and form Committees to focus on areas of Education, Energy, and Industrial Sources.	Received. Will pursue structure options and draft a constitution.

Appendix E

Summary of Co-located Air Quality and Meteorology Monitoring Stations in the BVL D (as of June 2006)

Continuous Monitoring	Endako	Burns Lake Fire Centre	Houston Firehall	Telkwa ⁴	Smithers St. Josephs
Location	Endako	#8-4 th Avenue	3382-11 th Street	1304 Birch Street	4020 Broadway Avenue
Meteorology	July 97-current	March 97-current	Nov 94-current	Jan 98-current	Nov 94-current
PM10		March 97-current	Feb 97-current	Feb 98-current	Feb 97-current
PM2.5		Install by Sept 06	Mar 01-current		July 04-current
Carbon Monoxide					June 97-current
Nitrogen Dioxide					June 97-current
Nitrogen Oxide					June 97-current
Ozone					June 97-current

Non-Continuous Monitoring	Hazelton	Kitwanga
Location	Northwest Community College	Kitwanga School
Meteorology		
PM10	05/04-current	05/04-current
PM2.5	05/04-current	

⁴ The Telkwa station is currently not in operation due to vandalism in 2005. A new location is being sought along with funding to replace the damaged equipment.

Appendix F

Sample Air Quality Advisory

Note: This is a new appendix as of June 2006 and replaces the summary of initiatives completed by the Resource Management Burning Subcommittee.



AIR QUALITY ADVISORY

Issued: Saturday April 8, 2006

The following air quality conditions are current as of the time this advisory was issued, and are driven by **particulate matter** in the atmosphere.
Air Quality Index (AQI): 0-25 Good; 26-50 Fair; 51-100 Poor; 100+ Very Poor

Community	AQI	Health Advisory
Burns Lake	75	yes
Houston	44	no
Telkwa	n/a	no
Smithers	31	no
Terrace	10	no

As a result of the measured, elevated levels of **particulate matter**, the Ministry of Environment and the Northern Health Authority Smithers have issued the following **Health Advisory** for those communities noted above:

People with reactive lung disease such as asthma should be aware that strenuous activity could trigger breathing problems.

For further information on health effects, please contact your local medical health office at <http://www.northernhealth.ca>.

Causes: This air quality episode is driven mainly by road dust during the day and wood smoke from residential / commercial heating at night. Other contributors include emissions from industry, back yard burning, automobiles, trucks and open burning. A maximum hourly PM₁₀ value of over 209 micrograms per cubic metre was recorded at the Burns Lake Fire Centre station at 9:00 PM last night.

A low centre of low pressure will make its way across the BVL D over the next 48 hours. This will bring periods of precipitation throughout the weekend, starting Saturday and continuing through Sunday. As rain is a good dust suppressant, it is expected that the overall air quality in the BVL D will improve during the weekend.

Mandatory Emission Reduction Actions

Area (<i>full definitions on page 2</i>)	Open Burning Restrictions
Lakes District including the Burns Lake area	yes
Bulkeley Valley and Upper Skeena including the Houston, Telkwa, Smithers and Hazelton areas	no
Inland Coast including the Terrace and Kitimat areas	no
Inland North Coast including the Stewart area	no

- **Open Burning Restrictions** for those areas noted above, are in effect until further notice by order of the Director (as defined in the *Environmental Management Act*) and authorized under the Open Burning Smoke Control Regulation [B.C. Reg. 145/93, s. 4].

No new open burns may be initiated, and no additional material may be added to existing open burns for the duration of the restrictions.

A person who contravenes these prohibitions commits an offence [B.C. Reg. 145/93, s. 5.] and is liable on conviction to a fine of not more than \$200,000.

These Open Burning Restrictions apply to the

Lakes District
Lakes District which includes the Burns Lake area
Lakes District including the Burns Lake area defined as the Nechako Drainage basin, including all tributaries such as the Ootsa, Eutsuk, Tetachuck, Cheslatta, Francois and Endako Drainage basins.

Voluntary Emission Reduction Actions

Community	Voluntary Emission Reductions
Burns Lake	yes
Houston	no
Telkwa	no
Smithers	no
Terrace	no

- Residents are asked to avoid using wood-burning appliances that do not meet US EPA or CSA emission standards unless such stoves are the only source of heat.
- Residents who must heat with wood are asked to ensure that a clean burn is occurring at all times, using well cured wood and having an adequate supply of air to the fire.
- Residents are asked to follow local backyard burning bylaws, and avoid backyard burning where a bylaw prohibiting this practice does not already exist.
- All other open burning activities that can be delayed until air quality and weather improves are also asked to be avoided.
- Residents are asked to seek alternatives where possible, to the use of single occupancy motor vehicles, and to walk, bicycle or carpool to destinations.

The Ministry of Environment will continue to monitor and reassess the situation. This Air Quality Advisory is in effect until further notice.

Contacts:	Skeena Region Air Quality Information Line 1-888-281-2992
Ben Weinstein (Phone: (250) 847-7224) Air Quality Meteorologist BC Ministry of Environment	Helen Joseph (Phone: (250) 638-6535) Air Resources Officer BC Ministry of Environment

Appendix G

Custom Venting Index Forecasting

Appendix G-1: Letter to BC Timber Sales / Woodlot Licensee to introduce Custom Venting Index Forecasting Service
Monday, November 17th, 2003

Re: Availability of Custom Venting Index Forecasting Service

My name is Ben Weinstein and I work with Ian Sharpe and Christine Rigby at the Ministry of Water, Land and Air Protection (WLAP) in Smithers. I am writing to inform you of a new service that WLAP is



offering with regards to venting requirements for burning under the Open Burning Smoke Control Regulation, for the remainder of this fall burning season, the option of custom **venting index forecasts**. As many of you are aware, Environment Canada issues a two-day venting index forecast each morning at 07:00. It has been brought to our attention that in some cases a two-day venting index forecast is not adequate and that a three-day venting index forecast is needed. We have therefore decided to offer the option of a three-day custom venting index forecast provided by myself, should it be desirable.

Perhaps I should take the time to introduce myself further.

I have an undergraduate atmospheric science degree from UBC. Upon graduating, I moved to Toronto to work as a weather forecaster for a small private weather firm. In August I accepted a position with WLAP which involves air quality research, more specifically the task of compiling micro-emission inventories for the Bulkley Valley and Lakes District (BVLVD). I feel confident that I can provide a product to meet your needs to open burn, as well as to meet the need of reducing impacts on air quality from that open burning.

Of course, there is a procedure to follow to get things under way. To properly meet your needs I will need to know certain data about you and your property namely:

- lot location
- elevation
- number and size of piles

If you send this information to me I will be happy to notify you when the venting is sufficient to ignite piles. I will contact you rather than you phoning each day to inquire about the venting conditions. Forecasts will be issued by 5:00 PM for the next three days. Should you not have email access at your residence I can also fax it to you. Remember though that if you want a forecast for the next day I will need your pile data by 11:00 AM.

This service is available for forecasts Monday through Saturday (i.e. no forecasts will be available for Sundays), and is in addition to options already in place including:

- Environment Canada Public Venting Index Forecasts for Smithers and Burns Lake: 1-888-281-2992 or <http://wlapwww.gov.bc.ca/epd/epdpa/venting/venting.html>
- Environment Canada Spot Venting Index Forecast: Call (250) 491-1544 to set up an account and call 1-900-565-2255 to obtain spot venting index forecast (fee of \$25 per forecast, will need to provide latitude, longitude, elevation and aspect)
- Test Burn (as per outlined in the Open Burning Smoke Control Regulation only)

Please note that you must call 1-888-281-2992 before igniting piles or adding debris, to determine whether the Regional Waste Manager has issued any burn restrictions under the Open Burning Smoke Control Regulation (alternatively you can be added to an email notification list to be informed of any burn restrictions).

Using the custom venting index forecast service does not in any way limit your ability to use these other options, but in order to properly assess the usefulness of the custom forecast service, maximum use of this trial offer is needed. If at any time the custom forecast service is not available, please use whichever other option is most appropriate.

The custom forecast service is on trial for the current burn season. Its success will be evaluated at the end of the season and if it is successful, work will begin towards providing for a custom venting index forecast system to be in place for future burn seasons. This service is free for the remainder of this season. Once again, the aim is to provide a viable three day alternative to Environment Canada's two day forecasts, and to reduce impacts on air quality from open burning in the BVLVD while allowing burns which need to happen.

Sincerely,

Benjamin Weinstein, BSc.
Air Resources Technician
Ministry of Water, Land and Air Protection

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ABOUT VENTING

Good venting results when the atmosphere's ability to mix is strong. Mixing is a product of two components, namely atmospheric instability (the atmosphere's willingness to move air upwards from the surface) and wind. Instability can be created by various phenomena including daytime heating of the earth's surface, topography, and convection (upward movement) associated with low pressure systems, while wind is mainly a consequence of strong horizontal pressure gradients. (Other types of wind do exist on a smaller scale.)

The key aspect of mixing is that its components, instability and wind deal with movement in different directions. Instability (mainly) deals with movement in the vertical while wind (mostly) applies to movement in the horizontal. Good venting requires contribution from both components, though it can be satisfactory with strong representation from only one.

PURPOSE

Checking the venting index forecast is a mandatory requirement for **licensees** wishing to perform prescribed forest harvesting/resource debris burning. Only under certain venting conditions (good today /good tomorrow, good today/fair tomorrow or in some areas fair today/fair tomorrow) is the burning of piled debris allowed. It was of concern to many licensees that the venting conditions issued by Environment Canada (EC) may not pertain to the area in which they wish to burn. Also, it was of concern that a two-day venting index forecast was not sufficient in order to properly manage all available resources; an area specific custom venting index forecast extending a third day was required. This was the service provided to any licensee who requested it.

METHOD

Unlike Environment Canada, no direct formula was used to calculate venting conditions. Instead, conditions were determined using a number of numerical models which included EC's 4-panel prognostic charts, soundings, **meteograms**, **windgrams**, and stability charts as well as high resolution satellite imagery and animated forecast-loops. This information is readily available on the internet and is provided by Environment Canada, University of British Columbia, the National Oceanic and Atmospheric Administration as well as various other universities and weather companies. Final decisions were made using a combination of the modeled data results as well as risk management.

Sample forecasts

GOOD VENTING

Here is my weather forecast. Good news and not so good news.

Tomorrow the venting conditions will be satisfactory at all locations. Good northeasterly winds and good mixing potential will act together to make burning conditions more than satisfactory.

I will skip Thursday for now and go to Friday, which will have very poor overall venting because the mixing potential is very small. As well, the winds will be weak up to 1250m.

Even burning at elevation above the mixing layer will not suffice, as the **atmospheric profile** will be extremely stable, and smoke will likely descend from altitude into the valley floors.

So that leaves Thursday, the day of transition. This shift in atmospheric structure will likely occur in the late afternoon. Thus Thursday's venting will be fair, for all locations.

Ben

POOR VENTING

Hi, I thought I'd give you a head's up on some unfortunate turn of events in terms of the venting.

Yesterday's optimism of the weekend's venting has vanished.

I mentioned yesterday that Saturday's venting would be good in some spots and fair in other spots above 800m, helped out by strong winds. Unfortunately, even these winds won't be able to work with the atmospheric profile that will be in place tomorrow. Low-level inversion followed by a pocket of warm air will ensure that no mixing occurs, even at elevations above 800m. Therefore, tomorrow's venting will be poor, even though Environment Canada has issued a 'good' forecast for tomorrow.

Sunday the winds will die down and the inversion will grow stronger, therefore venting will also be poor.

The reason for this about face has to do with the tracking and intensity of two low pressure systems, one that is centred in the eastern Yukon, and another offshore that will be passing through the region on Sunday. The intensity of the Yukon low has unexpectedly decreased, and as a result is not pulling air north with as much strength as is required to develop winds and move air masses.

Salvation may come on Monday when the offshore low I mentioned moves inland and leaves us behind. Right now our air source is the Pacific Ocean-warm and moist, and on Monday it looks to shift somewhat to being from the west and north.

This 'poor tomorrow poor Sunday' forecast applies to the entire region, at all elevations.

Ben

ALSO

Just a quick update, as I won't be in the office this afternoon.

The following is the venting index forecast for Burns Lake.

Fair tomorrow above 950m, poor below. Fair Friday above 950m, poor below and Poor Saturday. The incoming low pressure system has been delayed a day and so the warm front that I thought would pass through on Friday looks to be coming on Saturday instead. Conditions may improve after the front passes, though lately the weather has not been very cooperative.

How to Contact Us

This Plan is reviewed annually to measure progress towards goals and the effectiveness of the indicators and strategies for reaching those goals. The Plan contents may be revised through a consensus-based process at the Annual General Meeting and Clean Air Plan Review, or through the Board of Directors with input from the community.

All proposed changes and their rationale should be submitted to the process facilitator or MOE for review at the annual Plan review meeting. Submissions will be available for review at any time, and will be circulated in advance and added to the agenda of each yearly plan review meeting.

Individuals or organization wishing to join BVL DAMS, assist in implementation of specific initiatives listed in the Plan, or submit amendments, should also direct their inquiries to the Plan Implementation facilitator at:

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