

A REVIEW OF AIRSHED PLANNING IN BRITISH COLUMBIA

Prepared For:
The Ministry of Healthy Living and Sport
British Columbia

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DISCLAIMER

This report has been reviewed by staff of the Ministry of Healthy Living and Sport, but the conclusions and recommendations expressed herein represent the views of the consultant authors, and these views may or may not be supported by the Ministry of Healthy Living and Sport.

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EXECUTIVE SUMMARY

Airshed planning in British Columbia, for reasons outlined in section 4.10.4, is still evolving. As research into air quality and human health breaks new ground and new issues are identified, the number of managed airsheds in the Province is likely to rise. This will put increased pressure on the Government of British Columbia to provide support to a growing number of airsheds. Part of this will involve periodic review of the provincial airshed planning framework, updating it as required to reflect current knowledge and any legislative changes.

The current review is essentially a 'snapshot' of thirteen airshed plans in the Province which had been implemented, or were under development, at the time of writing this report. By most standards they have been remarkably successful in having achieved significant progress in a relatively short space of time. The key elements for their success may be summarized in the following points:

Leadership

A strong development team is crucial and its effectiveness will be determined by the quality of its leadership.

Process

The success of any plan will ultimately depend on developing and adhering to a process. Some plans are more complex than others and "one size doesn't fit all", however, reference to the established provincial framework is highly recommended when first developing a process (see Section 2.3).

Effective Communications

Early support and engagement of the community is important and involves an ongoing commitment to inform all stakeholders of their individual roles and responsibilities if the plan is to work.

External Support

It is unlikely that future airshed committees will be able to develop and implement plans without some level of financial support from external sources. In the absence of monetary constraints, the requirement for technical and regulatory support will continue in the foreseeable future.

In addition to the plans reviewed, two regions had identified air quality issues but were experiencing difficulties in making progress with planning efforts. Those difficulties are discussed and suggestions for their early recognition and avoidance are made.

In summary, the overall airshed planning process in British Columbia is enjoying success. Some areas for improvement were identified and recommendations are offered to the Provincial Government and to airshed planning groups to facilitate future efforts (see Section 5).

1 INTRODUCTION

Levelton Consultants Ltd. (Levelton) was retained by the British Columbia Ministry of Healthy Living and Sport (MoHLS) in December 2008 to conduct a review of airshed plans both under development and already implemented in the Province. The principal objectives of the review were to:

1. Summarize priorities and actions of each plan
2. Evaluate achievements relative to pre-defined performance indicators
3. Identify roadblocks to progress where planning or implementation has stalled
4. Categorize plans according to approach, priority and scale
5. Determine the overall effectiveness of the current planning process
6. Make recommendations as to how the Provincial Government could better support improvements to local air quality through enhanced airshed planning and related processes.

Plans for thirteen airsheds were reviewed and are listed alphabetically below:

- Bulkley Valley - Lakes District (BVLVD)
- Central Okanagan (RDCO)
- Fraser Valley Regional District
- Grand Forks
- Merritt
- Metro Vancouver
- Prince George
- Quesnel
- North Okanagan (RDNO)
- Okanagan – Similkameen (RDOS)
- Sea-to-Sky Airshed
- Whistler
- Williams Lake

Grand Forks was a late addition to the review since the airshed plan developed by the Boundary Air Quality Committee wasn't formally ratified until October 2008. Attention was also given to selected regions which had identified air quality issues but had not developed formal airshed plans. The objectives here were to understand why plans had not been developed, to determine if any barriers to progress existed and finally to suggest ways to avoid them.

2 BACKGROUND

2.1 DEVELOPMENT OF ENVIRONMENTAL REGULATION IN CANADA

Prior to the 1950s, there was little environmental legislation in Canada and legal action was based largely on common law and pursued privately through the courts. Typically, private rights were used to compensate those claiming damages as a result of environmental releases to air, water or land.

Although the common law approach continues to be applied today, such action started to fall from favour as environmental laws and regulations were developed. In Canada, these laws were originally intended primarily to protect natural resources for the benefit of industry but they nevertheless had beneficial effects on the environment itself. Legislation became more comprehensive during the 1960s and 1970s largely in response to a growing awareness both from anecdotal evidence and from a mounting volume of hard, scientific evidence of widespread environmental damage resulting from increased human activities.

During the 1970s and 1980s environmental law became an independent field in its own right. During this period both Federal and Provincial Governments began to develop environmental agencies or ministries which initially sought to mitigate environmental harm by regulating or prohibiting discharges of substances through the issue of licences or permits. Since the 1980s legislation has grown to encompass environmental planning, and new regulations governing clean air have become significantly more stringent.

Most recently the focus has been on global issues such as sustainability and climate change. Notwithstanding the importance of these and the attention they have garnered in recent years, concern for local environmental issues continues to grow.

2.2 AIR POLLUTION ISSUES IN BRITISH COLUMBIA

Over the past twenty five years, industrial permitting as a means of regulating emissions in British Columbia has resulted in reductions from industrial sources and relative contributions from non-industrial (unregulated) sources are growing. It has become increasingly apparent that non-industrial emissions may have significant detrimental effects on air quality. Fine particulate matter¹ arguably constitutes the highest risk to human health from air pollution in the Province. PM_{2.5} is principally derived from combustion products including but not limited to motor vehicles, agricultural sources, wood burning (associated with forestry, domestic wood stoves and back yard fires) in addition to industrial sources.

Air quality in B.C. is further compromised by the physical geography of the Province. Rugged terrain and weather patterns frequently combine to create temporary, localized pockets of poor air quality with the potential to produce negative effects on the health and well being of residents. This situation typically occurs in mountainous terrain where horizontal movement (advection) of air is impeded by valley walls and when vertical atmospheric motion is prevented during periods of temperature inversions and calm winds. Under such conditions, any air pollutants being released into the atmosphere will tend to accumulate, resulting in increased concentrations,

¹ By definition, fine particulate matter is composed of particles having diameters of less than or equal to 2.5 microns ($1\mu\text{m} = 10^{-6}\text{m}$) hence the acronym PM_{2.5}

sometimes to the point at which Canada-wide standards for ground level concentrations for certain air pollutants may be exceeded in the short term.

Knowledge of terrain and vagaries of the weather, coupled with a familiarity with local human activities, is essential to understanding how and when air quality in any particular region may be affected. This has led to the recognition that solutions to air quality issues in B.C. are best addressed by local planning groups comprising residents and regional stakeholders in the directly affected region.

An airshed is simply defined as a geographic region that in which dispersion or mixing of air emissions is occasionally limited by a combination of topographic constraints and meteorological (weather) conditions. Where terrain exercises only a minor role, an airshed may be defined by a political boundary (e.g. county or municipal boundary) for administrative purposes.

2.3 A FRAMEWORK FOR AIRSHED PLANNING IN THE PROVINCE

Early management of air quality in British Columbia focussed on the control of industrial point sources. However, the principal contributors to air pollution in major urban centres are emissions from mobile sources. As industrial emissions decline as a result of regulatory control and voluntary efforts to reduce emissions, the percentage contribution from mobile emissions in smaller centres is growing. As will be seen, control of industrial emissions in the Province has been very effective, but has in some areas unmasked residual air quality problems, resulting from other human activities previously considered minor contributors.

Recognizing this trend, the Waste Management Act was revised during the early 1990s to regulate domestic emissions (from wood stoves and open burning), motor vehicle emissions and fuel quality and to address growing concerns to human health from particulate matter and ozone. Programs were also introduced to educate citizens on matters relating to air pollution in general. These included 'Clean Air Day', 'Go Green' and the 'Wood Stove Change Out Program' which emphasizes the negative effects of older domestic wood stoves and encourages their replacement with newer, low emission units. At the same time, there was a growing awareness of the effectiveness of the airshed approach to air quality management in the Province. The following regions adopted this approach when they first developed air quality management plans in the years noted below:

- Smithers, 1992
- GVRD (Now Metro Vancouver), 1994
- Bulkley Valley, 1995
- Fraser Valley Regional District (FVRD), 1997
- Prince George, 1998

Over the past several years, in keeping with its commitment to implement Canada-wide standards for air quality and its provisions for Continuous Improvement and Keeping Clean Areas Clean, the B.C. Government has developed a framework for airshed planning for the Province. In 2005, the B.C. Ministry of the Environment (MoE) completed work on an interactive Air Quality Planning Tool² which was made available online to assist local communities interested in developing airshed planning strategies.

² "Air Quality Planning Tool – A Step by Step Process for B.C. Communities", The Sheltair Group (2005). For online access visit www.airqualityplanning.ca

In 2006 the MOE worked with BC Transit and Environment Canada to produce an online Clean Air Toolkit to help local governments develop emission reduction programs in their communities (<http://www.cleanairkit.ca>). That same year, the MoE also facilitated consultations with multi-stakeholder groups (including business, community groups, non-profit organizations, academic institutions and industry players) in Vancouver, Prince George and Penticton to identify expectations for the governance of airshed planning.

A few common themes arose from the consultation process:

- It was recommended that individual airshed groups should be allowed a reasonable degree of autonomy in making decisions to address local air quality issues.
- The Provincial Government (across its various ministries) should have a continuing responsibility for air quality management in B.C. particularly in regard to funding, delineating areas of responsibility, outreach programs, technical support and data acquisition and interpretation. It was felt that the Government's efforts should best be directed towards maintaining a fair and consistent framework for future airshed planning.
- Participants saw value in producing a "toolkit" to assist those wanting to develop airshed management strategies. Conceptually this would identify critical steps in the planning process and provide practical guidance for the implementation of each.

The findings of those consultations formed the basis of the B.C. Government's Provincial Framework for Airshed Planning³ which was released in March, 2007. The Framework addresses the need for an airshed management planning tool and communicates clear understanding of the Provincial Government's expectations of an airshed plan in terms of approach and content. It maps out a concise planning process while simultaneously ensuring implementation of the Canada-Wide Standards for particulate matter and ozone – pollutants of particular concern due to their health and environmental impacts.

The Provincial Framework is intended to meet the needs of a wide range of air quality interest groups from local stakeholders including municipal and regional government agencies, health care professionals, industry, businesses, agriculture, environmental interest groups and private citizens.

The Framework for Airshed Planning is founded on the following concepts:

- Shared stewardship
- Sustainable development
- Integrated planning
- Continuous improvement and "keeping clean areas clean"
- Flexibility
- Principles of adaptive management

³ See website: http://www.env.gov.bc.ca/air/airquality/#reports_plans

The six principal steps in developing an airshed management plan are to:

- Evaluate the need for a plan
- Identify and engage stakeholders
- Investigate synergies
- Determine priority sources (emissions inventory)
- Develop the plan
- Implement, monitor and refine

Recognizing that a plan is never complete but must constantly be refined to accommodate changing needs, routine performance monitoring of performance is necessary. This is the key element of the adaptive management process.

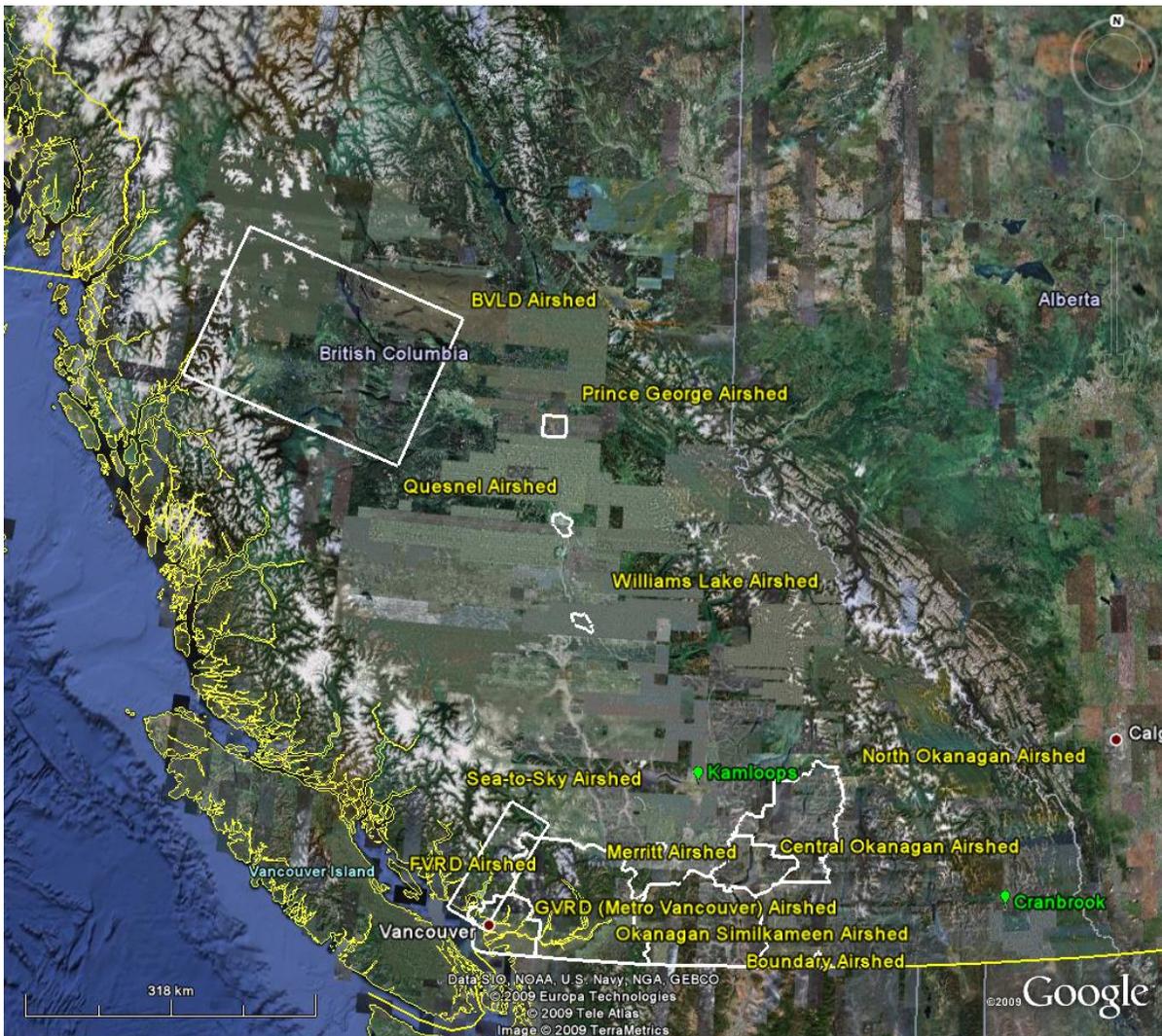
This review is in essence a routine monitoring exercise of the overall airshed planning process in the Province. It attempts to investigate which plans are working, and which are experiencing difficulties and makes recommendations as to how to how the current framework might be improved.

3 AIRSHED REVIEW

3.1 REVIEW SCOPE

In all, thirteen airshed plans were reviewed. A map showing their locations is provided in Figure 1. The boundaries of some airsheds (for example Sea-to-Sky, FVRD and Metro Vancouver) may overlap. Note that the Whistler Airshed although not shown lies within the Sea-to-Sky Airshed boundary.

FIGURE 1 – LOCATIONS OF AIRSHEDS REVIEWED



Map produced from Google Earth

Cranbrook and Kamloops were selected for separate consideration since both have identified air quality issues but, at the time of writing, neither had started to develop detailed airshed plans. The intent here was to understand what, if any roadblocks might have stalled the planning process and to investigate ways to avoid potential pitfalls from the outset.

3.2 METHODOLOGY

Airshed planning involves the coordination of a number of simultaneous activities. These include administering the overall process, developing and implementing the plan, public outreach programs and stakeholder engagement (thus ensuring equal representation of all interest groups at the airshed committee table).

Evaluating the goals of an airshed plan, i.e. improvements to local air quality, is a relatively straightforward, quantitative exercise. However predicting a plan's likelihood of success is a more difficult process involving a number of variables, several of them quite subjective in nature. The process was therefore started by developing a suite of indicators aimed at maximizing the objectivity of the process. These indicators were jointly developed by Levelton and MoHLS staff and are categorized by activity in Table 1.

TABLE 1 - PERFORMANCE INDICATORS USED

Activity	Indicator
Public Outreach	<ul style="list-style-type: none"> • Has an outreach program been established? • If so, how frequently are stewardship reports issued to community? • Is there an airshed web page? Are 'hits' measured over a given period? • Is the web page linked to other sites for public engagement e.g. AQI etc. • Are there any tangible measures of public opinion change? • Are there attendance records from scheduled events e.g. Clean Air Day? • Is there a hotline to report air quality concerns - odour complaints etc.?
Planning and Implementation	<ul style="list-style-type: none"> • Is the plan fundamentally (a) Issue driven or (b) proactive e.g. no current issues but establishing controls to mitigate future AQ issues? • Have high level goals and expectations been documented? • Do objectives also incorporate: (a) GHGs, (b) sustainability, (c) neither? • Does the airshed planning group have a 'champion' in local government? • Is the plan incorporated into other municipal plans or processes? • Have specific, quantifiable objectives been defined (either source emission, or receptor concentration or both)? • Has an emissions inventory been conducted? • Funding breakdown %MoE, % other. Total \$\$ if available. • Have milestones been established (specific activities towards implementation including end dates)? • If so, has progress been made towards implementation [% milestones reached or (a) on schedule, (b) behind schedule]? • Have amendments been made to legislation e.g. Permit amendments, burning bylaws etc.? • Have scientific studies been conducted e.g. to quantify emissions, dispersion modeling, local or regional health studies? • Was a thorough literature review conducted? • Have any other technical / scientific studies been conducted? • Have any regional programs been implemented e.g. Woodstove change-out, idle free, scrap it etc.
Stakeholder Engagement	<ul style="list-style-type: none"> • Has an airshed committee been established? • Membership - Industry, public, municipal / provincial govt. members? • Membership trends (a) increasing, (b) static, (c) decreasing? • Is the committee active (ongoing activities)?

Airshed plans were then reviewed in detail, additional information being obtained from referenced materials including internet web pages where applicable. Plans for each airshed were then summarized in a spreadsheet (see Appendix 1, Summary Table).

The next step was the development of a template for a questionnaire to be completed by selected administrative personnel in each airshed committee. This was based primarily on the performance indicators but also probed for additional information not contained in the published plans. The blank questionnaire is shown in Appendix 2. After discussions with MoE personnel (regional meteorologists) administratively responsible for each airshed, the questionnaires were distributed to the most knowledgeable members of the airshed committees for completion. In some cases the regional meteorologists completed the surveys, occasionally in parallel with response from another committee member from the same airshed.

Concurrently, phone interviews between Levelton staff and airshed committee members were conducted. These were informal in nature and were directed at understanding some of the underlying reasons for relative successes or shortcomings of developing and implementing individual airshed plans. A broad range of topics were covered ranging from budget considerations and technical information to governance and committee structure. Interviews were also conducted regarding air quality issues identified in Cranbrook and Kamloops in an attempt to understand what progress had been made in those communities and in particular if any impediments to progress had stalled the planning process. Notes from these conversations form the basis for additional discussion in the analysis and recommendations.

4 ANALYSIS

4.1 GENERAL

The objective of the analysis is not to rank the relative success of the airshed plans under review, but to identify key elements in the planning process which are most likely to result in a successful plan. Frequent reference has been made to information contained in planning documents, referenced web pages, discussions and interviews with regional air quality meteorologists and airshed committee members as well as data from the completed questionnaires (see Appendix 2). The summary table in Appendix 1 is also referenced.

Finally, three case studies are presented, the first two focusing on the Kamloops and Cranbrook airsheds where air quality issues have been identified but where difficulties were encountered in developing plans. The third looks at the Merritt airshed where a plan was successfully developed and implemented and which is already showing promise in terms of air quality improvement.

4.2 BASELINE DATA

Establishing a baseline of current air quality is essential to providing the foundation for a sound airshed plan. It is the only basis for comparison when evaluating subsequent trends in air quality, against which the ultimate success of the plan will be measured.

Baseline data incorporates not only an emissions inventory but also a history of air quality monitored in the region. The axiom 'more is better' is good, but an unbroken record of data taken over a year will likely be more valuable than 5 years or more of sporadic monitoring. Quality assurance is therefore an important consideration and was noted to be a source of concern in several airsheds reviewed. In some cases monitoring had been conducted but since ceased, in others it had been sporadic. In other airsheds, where monitoring was being implemented for the first time, a common difficulty at the outset was finding a suitable location for the equipment. There was an apparent reluctance to volunteer suitable space required to house and provide power to the monitors.

Actions taken to improve air quality may take time to become apparent in routine air monitoring records. Regions having poorer air quality from the outset might expect to see earlier successes than those in which baseline air quality is relatively good (i.e. where elevated concentrations are generally lower in value and less frequent to begin with). This is an important consideration in determining metrics against which to gauge progress. Where point source emissions are monitored (e.g. as permit requirements) it may be useful to focus on emissions reductions as a means of gauging progress in airshed planning. Significant reductions (resulting from regulatory changes, improvements to pollution abatement equipment or plant closure) will very likely result in a longer term reduction in monitored ground level concentrations of air contaminants.

Simply put, the broad goal of improving air quality to meet Canada-Wide Standards for air quality in all communities may take months or even years to achieve. However, early progress towards that goal is evidenced by direct observation of planned emissions reductions.

4.3 CATEGORIZING AIRSHED PLANS

4.3.1 Reactive vs. Preventive Planning

Airshed plans can be categorized in various ways, one of the most obvious being whether they are driven in response to existing air quality issues (reactive) or to mitigate future potential issues (preventive). Of the thirteen reviewed, eleven were developed in a reactive mode. Only two, namely Sea-to-Sky and Whistler, were developed primarily in a preventive mode, although the Sea-to-Sky questionnaire indicated that current air quality is already perceived to be having a health impact in that airshed.

Both approaches recognize the need for a management framework to ensure longer term air quality goals but priorities will differ according to which mode is the primary driver.

Whistler's plan was the first in Canada to focus on managing greenhouse gas emissions, energy and air quality under the umbrella of environmental sustainability. The Sea-to-Sky Airshed plan borrows from this approach by applying the same basic principles to the corridor extending north from Bowen Island up to and including Pemberton. This unique approach still supports all expectations under the existing Airshed Planning Framework for the Province (see page 4).

Despite their similarities, the two plans differ fundamentally in one respect. The Whistler plan is specific to the interests of the resort municipality (although it does recognize the potential impact of transportation associated with the tourism industry). The Sea-to-Sky plan by contrast covers a large area (of approximately 5,700 km²) including the communities of Gibsons, Langdale, Squamish, Pemberton, parts of West Vancouver and Howe Sound as well as the Resort Municipality of Whistler. While the ultimate success of the Sea-to-Sky plan may not become evident for some time, it will rest heavily on the ability of the Airshed Management Committee to administer and coordinate the efforts of all its participant communities.

Reactive versus preventive airsheds require different approaches, but knowledge of which approach is taken is not in itself a good indicator of success.

4.3.2 Issue Identification

Most airshed plans are reactive, in that they are developed because of existing and growing air pollutant concerns. These plans are a key tool in identifying high priority air quality concerns as a basis for developing the most effective emission reduction strategy. In urban areas, these concerns include emissions from industry, open burning, transportation, agricultural burning and domestic heating. The main pollutants of concern include particulate matter (PM_{2.5} and PM₁₀), nitrogen dioxide, ozone and sometimes sulphur dioxide and total reduced sulphur (TRS). Except for TRS, which is mainly an odour issue, all of these pollutants have been shown to have direct impacts on health.

4.3.3 Population and Population Density

Insofar as densely populated airsheds tend to have more complex air quality issues, population size and density have an influence on air quality management planning. The Metro Vancouver and the Fraser Valley Regional District (FVRD) airsheds are predominantly urban environments and have numerous emissions sources from a wide range of activities. Complex problems invariably require complex solutions. In heavily populated environments, transportation becomes a more significant contributor to poor air quality than in less densely populated regions and issues require more sophisticated, longer term solutions.

Metro Vancouver and FVRD have planning authority under the Environmental Management Act (EMA) and through provincial Order in Council, respectively, and therefore received only minor attention in the scope of this study.

4.4 SETTING GOALS AND PRIORITIES

Goal setting and clear identification of the steps required to meet those goals are fundamental to any airshed plan, but until baseline data have been established, it is difficult to set specific targets. A common theme in the review was that, having established comprehensive baseline data, specific goals were either not clearly articulated or lacked clear, measurable steps towards implementation.

Goals tended to be quite ambitious, possibly as a result of trying to satisfy multiple objectives too early in the planning process. The value of simple, stepwise planning and subsequent reliance on adaptive management principles tended to be overlooked.

Table 2 summarizes the goals and priorities identified for each airshed plan. Actions towards implementing those goals, achievements to date and any notable obstacles are also included.

4.4.1 Risks Associated with False Assumptions

Perception can introduce an element of risk in air quality management and if not kept in check can lead to false assumptions and misplaced efforts. While little direct evidence of this was found during the review, one example of how it can occur was worthy of note. A belief held by some Boundary Air Quality Committee members in Grand Forks was that the existing particulate problem in the region would be largely solved following the closure of the Canpar plant and the implementation of additional emission reductions from the Roxul facility. However, since those changes occurred, it appears that airborne particulates may still be a problem in Grand Forks indicating that other sources had been partially masked by commercial and industrial emissions.

TABLE 2 – GOALS, PRIORITIES AND ACTIONS OF EACH AIRSHED

Airshed	Goals	Priorities	Actions	Achievements	Roadblocks
<p>Bulkley Valley Lakes District http://cleanairplan.ca/documents/Complete.pdf</p>	<ul style="list-style-type: none"> • Continuous improvement of air quality and quality of life for local residents. 	<ul style="list-style-type: none"> • Reduction of particulate matter from combustion and road dust. 	<ul style="list-style-type: none"> • Eliminate Tier 1 beehive burners • Reduce emissions from all beehive burners • Establish smoke management plans for forestry operations. • Develop BMPs for road mtce. Operations. • Educate residents and provide incentives to reduce domestic emissions. 	<ul style="list-style-type: none"> • BMPs for road mtce. completed (airshed committee with MoT, MoE support) • Tier 1 burners eliminated • Voluntary cutback plans adopted by other industries for use during AQ episodes. 	<ul style="list-style-type: none"> • No specific roadblocks were identified.
<p>Central Okanagan http://www.regionaldistrict.com/docs/boards_committees/AirQualityManagementPlan.pdf</p>	<ul style="list-style-type: none"> • Meet and exceed Canada wide standards for particulate matter. • Recognizes several strategies already in place but seeks additional improvements. 	<ul style="list-style-type: none"> • Particulate matter and ozone. 	<ul style="list-style-type: none"> • Seek a common regulatory approach for open burning in the region • Educate public (BMPs for solid fuel burning appliances) • Encourage incorporation of air quality objectives into public transport management plans. (Low emission vehicles and fuels.) • Encourage local industry to pursue emissions reduction initiatives. 	<ul style="list-style-type: none"> • Air quality advisory system in place • Public education programs including wood stove change out program and the Scrap It program. http://www.kelowna.ca/CM/page464.aspx 	<ul style="list-style-type: none"> • Roadblocks to progress following recent elections in the Okanagan. Difficulties arising from conflicting municipal planning objectives.
<p>Fraser Valley Regional District</p>	<ul style="list-style-type: none"> • Develop a unified, long term approach to air quality management in the FVRD. 	<ul style="list-style-type: none"> • Broad based and complex. • Targets all CACs in a region encompassing several large municipalities. 	<ul style="list-style-type: none"> • Recommendations too numerous to summarize. 	<ul style="list-style-type: none"> • Pending update of airshed management plan scheduled for 2009 	<ul style="list-style-type: none"> • No specific roadblocks were identified.

Airshed	Goals	Priorities	Actions	Achievements	Roadblocks
<p>Grand Forks http://www.city.grandforks.bc.ca/air/aqmpplans/GrandForksAQMP-Oct22.pdf</p>	<ul style="list-style-type: none"> • Prevent future deterioration of air quality by meeting CWS for PM • Ensure citizens and visitors have healthy air to breathe, • Educate and inform community and surrounding area on AQ issues, • Integrate goals into local and regional policies and planning mechanisms, • Ensure strong and sustainable local economy that has positive impact on air quality 	<ul style="list-style-type: none"> • Reduce particulate emissions from industrial sources. • Reduce smoke from residential sources including woodstoves and outdoor burning. • Reduce emissions from mobile sources. • Reduce road dust. 	<ul style="list-style-type: none"> • Industry action by installing new stack and emissions control equipment. • Community wood stove change out program. • Backyard burning ban in residential areas. • Implement outdoor wood-fired hydronic boiler bylaw • Educate farmers on AQ/wind conditions to minimize AQ impacts 	<ul style="list-style-type: none"> • Industry has taken action. New facilities to control particulate emissions are already online. • Additional actions noted are scheduled for implementation in 2009-2010 	<ul style="list-style-type: none"> • No serious roadblocks identified although there are some budgetary exist.
<p>Merritt http://www.env.gov.bc.ca/air/airquality/pdfs/merritt_aqmp.pdf</p>	<ul style="list-style-type: none"> • Minimize risks to public health from smoke and dust pollution, • Improve visibility • Prevent future deterioration and work towards continuous improvement of air quality • AQ targets include annual PM2.5 level of 5 ug/m³ and PM10 level of 20 ug/m³ 	<ul style="list-style-type: none"> • Reduce emissions from combustion (industrial, forestry, vehicular and domestic). • Reduce dust emissions from various sources. 	<ul style="list-style-type: none"> • Each agency to develop plans to meet specific recommendations. • Resume monitoring program. • Develop public education programs. • Develop legislation to mandate woodstoves and outdoor burning. • Ensure that forestry observe ventilation conditions when burning. 	<ul style="list-style-type: none"> • Tolko burner progressively reduced combustion of wood waste. All now trucked off-site. • Two mills have paved large areas of their sites significantly reducing airborne dust. • Public education programs successful - willing local media support. • Monitoring resumed. 	<ul style="list-style-type: none"> • The Merritt burning bylaw has limited effect as open burning is still allowed by the RD in surrounding rural communities.

Airshed	Goals	Priorities	Actions	Achievements	Roadblocks
<p>Metro Vancouver http://www.metrovancouver.org/about/publications/Publications/AQMPSeptember2005.pdf</p>	<ul style="list-style-type: none"> • Minimize risk to public health from air pollution, • Improve visibility, • Minimize Greater Vancouver's contribution to global climate change. 	<ul style="list-style-type: none"> • Broad based and complex. • Targets all CACs in Canada's third largest metropolitan area. • Reduce emissions from major sources. • Develop local AQMPs • Enhance air quality information and public awareness. 	<ul style="list-style-type: none"> • Numerous actions identified related to marine sources, motor vehicles, agricultural equipment, industrial, commercial and institutional sources, agriculture and communities 	<ul style="list-style-type: none"> • October 2008 progress report documents numerous achievements since 2005. 	<ul style="list-style-type: none"> • Changing priorities will introduce some opportunities and challenges for the future. • GHG management pending new Federal regulations expected to be finalized in 2009. • Metro Vancouver and FVRD collaborating with others to develop national and regional strategies to address visibility issues.
<p>North Okanagan</p>	<ul style="list-style-type: none"> • Less smoke in the valley. • Less dust in the air • Fewer emissions • Fewer kilometres travelled on the roads 	<ul style="list-style-type: none"> • Reduce smoke from combustion sources. • Reduce dust emissions • Implement educational strategies. 	<ul style="list-style-type: none"> • Anti-idling campaign • Wood stove exchange • Clean air day • Dust control through implementation of road mtce. strategies • Full on-site chipping or flail mowing program for agriculture waste • Composting program for yard waste 	<ul style="list-style-type: none"> • Undetermined 	<ul style="list-style-type: none"> • Roadblocks to progress following recent elections in the Okanagan. Difficulties arising from conflicting municipal planning objectives.

Airshed	Goals	Priorities	Actions	Achievements	Roadblocks
<p>Okanagan Similkameen http://www.rdosmaps.bc.ca/min_bylaws/ES/AQ/RDOSAirQualityManagementPlanJune5_06.pdf</p>	<ul style="list-style-type: none"> • Safeguard and improve air quality in the Okanagan Similkameen RD. 	<ul style="list-style-type: none"> • Smoke • Fine dust • Vehicle emissions 	<ul style="list-style-type: none"> • Implement burning bylaws. • Provide alternatives to burning (e.g. chipping/tub grinding program for agricultural waste and composting program for yard waste). • Implement recycling of plastics • Develop educational programs • Improve communications between Ministry of Forests, MoE and fire departments in the RD. 	<ul style="list-style-type: none"> • Burning bylaws implemented. • Observed reduction in open burning activity. • Evident improvements to regional visibility. 	<ul style="list-style-type: none"> • Reduction in burning in the agriculture and forestry sectors has been slow. Improved communication between Provincial Govt. departments recommended.
<p>Prince George Phase I: http://www.pgairquality.com/files/pdf/PRAQMP-P1(1998).pdf Phase II: http://www.pgairquality.com/files/pdf/PRAQMP-P2(2006).pdf</p>	<ul style="list-style-type: none"> • Achieve and maintain acceptable air quality by reducing emissions of those contaminants that are causing unacceptable air quality, and by preventing future air quality problems from developing 	<ul style="list-style-type: none"> • Industrial sources of fine particulate matter and odours. • Control sources of dust within the town. 	<ul style="list-style-type: none"> • January 2009 PGAIR announced it will work with all PM emission sources to voluntarily reduce emissions. • Specific targets and deadlines established. 	<ul style="list-style-type: none"> • Implemented a bylaw banning open burning and non-essential residential burning during advisories. • All beehive burners closed down. • Stringent limits on emissions from sanding, sweeping and paving activities. • Source apportionment studies carried out to support development of Phase 3 airshed plan 	<ul style="list-style-type: none"> • Some committee members lack required level of authority to make decisions / undertake actions on behalf of parent organizations.

Airshed	Goals	Priorities	Actions	Achievements	Roadblocks
Quesnel http://www.quesnelairshed.org/PDFs/QuesAMP.pdf	<ul style="list-style-type: none"> Clean air targets for PM10 and PM2.5 of 40 and 18 µg/m³ by 2010 (based on annual 98th percentile averaged over 3 years). 	<ul style="list-style-type: none"> Reduce PM emissions from all sources, including combustion sources and road dust. 	<ul style="list-style-type: none"> Improve dust control from paved and unpaved sources through paving, use of dust suppressants and other strategies Upgrade industrial emission controls Educate residents and provide incentives to reduce domestic emissions. 	<ul style="list-style-type: none"> Wood stove change out program implemented. Phase-out of wood waste burner Forest industry emission reductions Burning bylaws implemented Vehicle idling reduction program implemented. 	<ul style="list-style-type: none"> No specific roadblocks were identified.
Sea-to-Sky http://seatoskyairquality.ca/reading-room/r-quality-planning-reading-room/	<ul style="list-style-type: none"> Improve regional AQ so there are substantially fewer incidences of respiratory related medical visits and health care costs Maintain, protect and improve aesthetic viewscapes and vistas through management of emissions contributing to poor visibility events 	<ul style="list-style-type: none"> Reduce transportation emissions. AQ improvement initiatives having GHG benefits. 	<ul style="list-style-type: none"> See RMOW below SLRD regional growth strategy 	<ul style="list-style-type: none"> Idling bylaws 2008. No annual reports available. 	<ul style="list-style-type: none"> Difficulty coordinating efforts of several communities. Other regional growth strategies introduce duplication of effort. Major highway improvement projects may have negative effects. Higher priorities take precedence over AQ.
Resort Municipality of Whistler (RMOW) http://www.whistler.ca/images/stories/sustainability_images/GHG%20information/whistler_int._energy_plan.pdf	<ul style="list-style-type: none"> 20% reduction of GHGs from <u>municipal</u> operations from 1990 levels. Overall 6% reduction of GHG emissions from <u>all</u> RMOW sources from 1990 levels. Excellent air quality 	<ul style="list-style-type: none"> GHG emissions from energy consumption and solid waste disposal. 	<ul style="list-style-type: none"> Switch from propane to natural gas. Further improve efficiencies in transportation strategy. 70% reduction in solid waste transfer by 2020. 	<ul style="list-style-type: none"> No status update available. Net decrease in GHG emissions 2003-2007. Slight reduction in waste transfer 2003-2007. Burning bylaw implemented 2004. 	<ul style="list-style-type: none"> None identified.

Airshed	Goals	Priorities	Actions	Achievements	Roadblocks
<p>Williams Lake http://www.williamslake.ca/files/4/WLAirshed_Mgt_Plan_Final.pdf</p>	<ul style="list-style-type: none"> • Clean air targets for PM10 and PM2.5 of 50 and 20 µg/m³- by 2009 and 40 and 18 µg/m³ by 2012 (based on annual 98th percentile averaged over 3 years). 	<ul style="list-style-type: none"> • PM emissions from all sources are to be reduced, including from combustion sources and road dust. 	<ul style="list-style-type: none"> • Improve dust control from paved and unpaved sources through paving, use of dust suppressants and other strategies • Upgrade industrial emission controls implemented by MoE. • Educate residents and provide incentives to reduce lifestyle impacts on air quality, such as backyard burning and home heating 	<ul style="list-style-type: none"> • Wood stove change out program implemented. • Forest industry emission reductions • Burning bylaws implemented • Vehicle idling reduction program implemented. 	<ul style="list-style-type: none"> • No specific roadblocks were identified.

4.5 COMMITTEE MEMBERSHIP AND GOVERNANCE

Trends in committee membership were used as potential indicators for success in airshed planning. Most committees reported either modest growth or no change since their establishment. One reported that numbers had declined but mentioned that those who remained had accomplished a great deal, suggesting that small committees may offer some efficiency. In general, however, trends in membership numbers had little evident correlation with successful airshed planning.

What did emerge, is that the selection of committee members, their skills, roles and more importantly their dedication to task is crucial to assembling a successful planning team. The term 'Champion' was used to describe an individual (usually the committee chairperson) who had the ability to lead, inspire and influence others, but moreover, by virtue of their position in local or municipal government, also had the necessary authority to take direct action on decisions and therefore to maintain progress. One planning committee was staffed with members possessed with excellent technical skills, but who lacked the necessary level of authority to implement plans and maintain progress effectively.

Airsheds encompassing more than one or two municipalities found it difficult to maintain progress as committee representatives from each municipality would have to seek authorization from higher authority before acting on key decisions. One respondent indicated that little progress was typically made during airshed committee meetings for that reason.

4.5.1 Committee Meeting Schedules

Meetings were typically held on a monthly basis, but two airsheds reported quarterly and biannual schedules respectively. All reported that attendance at regular meetings was good but one noted that attendance at the annual general meeting had been disappointing. No airshed reported ever having failed to establish a quorum. Meeting schedules of technical working groups or sub-committees were not discussed during the review.

4.6 FUNDING

No common approach to reporting or estimating funding was apparent and budgets varied considerably according to the needs of individual airsheds. Those which had not begun the implementation process had significantly lower costs than those establishing or maintaining programs. The Grand Forks committee reported an operating budget of \$15K but had not yet started implementing the plan. Sea-to-Sky reported \$67K for 2008 and forecast a lower budget for 2009. Prince George's programs for 2008-2009 were estimated to be approximately \$250K including the committee coordinators salary but excluded the initiatives of the working sub-committees and in-kind contributions. Total costs are therefore likely to be significantly higher, particularly for those in the implementation phase.

Percentage contribution from external funding was initially low during plan development but reliance on external financial support tended to increase during implementation. As an example, the Boundary Air Quality Committee was funded 90% by the Municipality of Grand Forks and 10% by the Regional District for the costs associated with developing their airshed plan.

Reliance on external funding may decrease following initial capital expenditures (associated with implementation) but will continue at some level during the operational life of the plan.

If airshed planning committees were to adopt standard funding formula, budget profiles may potentially become indicators in predicting success.

4.7 PUBLIC OUTREACH

Public outreach includes all activities designed to engage local residents and stakeholders in committee activities and to foster their confidence and support for the airshed plan. Human activity plays an important role in determining air quality and outreach programs can motivate people to bring about tangible improvements to air quality. Education is as much a component of outreach as is communicating a sense of accountability to the public at large. Both encourage citizens to accept some degree of responsibility both for the problem of air quality as well as its solution.

4.7.1 Communication Strategies

Two airshed committees acknowledged not having a communications strategy in place but all had implemented or were considering implementing some form of public outreach program. Without exception all airsheds reviewed had either a dedicated internet webpage or a site, often a website maintained by the local municipality, from which airshed management plans could be downloaded. Most sites provided links to other related resources including the AQHI, vehicle idling and outdoor burning bylaws, wood stove change out programs, and the “Burn it Smart” program sponsored by Natural Resources Canada. Air quality and airshed planning information was not always conveniently located necessitating extra time and effort when searching through web pages. Web pages were not consistently maintained and updated.

Some committees routinely had booths at local trade shows, shopping malls and various public events, some promoting a variety of additional environmental programs including recycling and composting of yard waste. Others publicized programs promoting specific initiatives including the detrimental effects of open (outdoor) burning, woodstove exchange program and the promotion of energy saving devices.

None of the airshed committees operated a dedicated telephone ‘hotline’. Committee members were typically available to answer any questions relating to air quality. One airshed reported that contact with regional MoE officials was encouraged if there were any issues of concern.

None of the airsheds reviewed had conducted formal public opinion polls and relied on statistics gathered from related activities such as woodstove exchange program questionnaires and attendance records from local environmental events. In general, little useful information was available to gauge public awareness specific to air quality management activities.

One committee obtained statistics from their internet service provider which listed website visits, views and hits by month for 2008. Statistics continue to be collected to analyze future trends which may have some value as surrogate statistics for public awareness.

4.8 PLAN DEVELOPMENT AND IMPLEMENTATION

Airshed planning is complex and requires the management of several simultaneous activities. Issue definition, emissions inventory compilation, dispersion modeling and efforts to engage public interest can be administered concurrently but must be well coordinated if progress is to be maintained. For this to occur, some key milestones must be selected against which progress can be measured.

4.8.1 Evaluating and Reporting Progress

Any reduction in pace may be indicative of a fundamental shortcoming of the plan and some means of measuring progress is required. Beneath the overarching objectives of the plan, a

second tier of more specific goals must be established. These should be clear, measurable steps which will ensure implementation of key elements and which will also be used to gauge progress. Therefore, each step must be paired with a completion deadline for it to be effective.

Although some airsheds were still developing second tier goals at the time of the review, it was generally found that those already in place were rather vaguely defined or lacked clear deadlines.

Responses to the survey question asking what approximate stage of implementation had been reached in some cases lacked numerical estimates. One respondent estimated that approximately half the milestones had been completed but that progress was difficult to assess since the work plan is an iterative process occasionally necessitating additional activities. Another estimated that the plan had probably reached the 25-50% completion stage. A third respondent noted that implementation of the plan had only started in 2008 and progress during the first year had not yet been evaluated.

4.8.2 Integration

Integration with existing community plans was initially considered as a potential indicator of success. However, the review showed that, while it may facilitate municipal administration, integration appears unlikely to enhance a plan's chances of success, with one exception. Kamloops, as discussed, has accepted airshed planning as a component of its sustainability plan. However, the objectives of sustainability do not necessarily correspond with those of maintaining clean air. For example, reduced reliance on purchased energy for home heating may be achieved by increased use of domestic woodstoves. However resulting increases in particulate emissions may result in reduced local air quality.

4.9 CASE STUDIES

The terms of reference for the study include a review of air related activities in communities where stakeholder have expressed interest in air quality but where progress towards airshed planning has run into difficulties. These are presented as two short case studies. At the time of writing, Kamloops and Cranbrook had identified air quality issues but neither had been able to make significant progress towards resolving them. The third case study looks at the City of Merritt where by little if any difficulty was encountered following recognition of an air quality problem and plans were drafted and implemented in a relatively short space of time.

4.9.1 Kamloops

Early efforts to take action on air quality issues in Kamloops encountered resistance from the municipality who were reluctant to provide support and financial resources to the plan. Efforts to improve air quality were seen as primarily the responsibility of the MoE. More recently, the municipality has accepted the inclusion of an airshed plan as an integral component of an overall sustainability plan which is currently under development. This is seen as encouraging news to those supporting air quality improvements in Kamloops and incorporating airshed management objectives into the sustainability plan is consistent with the integrated planning concept in the existing provincial framework.

Lack of 'buy in' from local government was a theme commonly expressed during the interviews. None of the plans reviewed were developed without municipal agreement, but several were slow to progress until municipal support had been secured. It is therefore important to take a poll of

public interest early in the planning process; the local government may not necessarily agree that an air quality problem exists. However, if statistics indicate widespread support in the community, they may help to foster municipal acceptance hence removing a potential obstacle to progress.

4.9.2 Cranbrook

Cranbrook has a more complex problem. As with Kamloops, local stakeholders have also experienced resistance when seeking municipal support, but the difficulties in Cranbrook have been compounded by Council's historic perception that air quality is not a problem and that local residents would be opposed to the expenditure of City funds or staff time on air quality. The observation was also made that the majority of senior City staff or council do not perceive any degradation of air quality in the region as being related to domestic burning within City limits, and further believe that there would be strong resistance to changes imposed on the lifestyles of residents if bylaws to restrict burning were enacted. The opinion was expressed that a higher/more senior level of MoE direction to kick-start local efforts to improve air quality might accelerate progress toward those ends.

Regardless, it appears that as long as local airshed management is viewed as unimportant or low priority by municipal councils it has little chance of succeeding over the longer term. This suggests a recommendation for increased effort in the area of public education regarding air quality issues, their origin and their potential to compromise human health, especially for municipalities that have known air quality concerns and have been reticent to initiate any kind of action. Until those connections are made in people's minds there will be lack of common will to accept responsibility for corrective action.

4.9.3 Merritt

Merritt by contrast developed and implemented a sound airshed plan between 2006 and 2008 and early success toward measureable improvements in air quality is already evident. This may in part be due to the small size of the community and the relative ease of identifying emission sources but it rests as much on strong committee leadership and the commitment of all sectors of the local economy and the support of its citizens. The following paragraphs are based on notes taken during an interview with a former member of the airshed committee.

Merritt benefitted from having an unbroken record of air quality monitoring data between 1990 and 2003. Measured readings of particulate matter (PM₁₀) were among the highest recorded in the province. Recognizing that total particulate matter (derived from smoke and dust particles) was a potential risk to human health and welfare in the area the MoE recommended an air quality stakeholder committee be convened to develop a plan to improve and protect air quality in the city. Accordingly, in 2006 public meetings were held to discuss the issues and at the same time encourage the interest and support of the community in helping to resolve them.

From the outset response was positive. Local forestry industry representatives, the Nicola Tribal Association, the Merritt Seniors Association, the B.C. Lung Association, the Interior Health Authority, the B.C. Ministry of the Environment in addition to forestry consultants and community members were all represented on the committee. Chaired by a City of Merritt Councillor and mentored by MoE personnel, the committee met monthly between May 2006 and April 2007 during which time the airshed management plan was drafted.

The forestry products industries were quick to recognize their contribution to local air quality issues and responded by developing plans to reduce reliance on beehive burners to combust

wood waste. Increasing volumes of locally produced wood chips were transported offsite to a power generating facility in Kamloops for incineration in a class 1 (low emission) burner. At the time of writing, no beehive burners remained in operation in the area. Other industry players recognized their contribution to the dust problem and paved large areas of their operations to improve the situation. The municipal government took action by reducing the amount of road sanding in the winter and increasing the spring street sweeping.

Local news media were quick to commit to the plan and cooperated with other agencies to promote educational programs aimed at reducing residential emissions from domestic wood stoves and outdoor burning of yard waste.

It is difficult to pinpoint the chief reason for Merritt's success other than the fact that no roadblocks were encountered. Leadership was evidently a contributor but perhaps the key element was the early engagement of local residents and the strong support that they subsequently provided.

4.10 KEY ELEMENTS OF A SUCCESSFUL AIRSHED PLAN

4.10.1 Strong Leadership

A strong development team is crucial and the effectiveness of that team will be determined in large part by quality of leadership. It is the leader's role to maintain interest and effectiveness at the committee level, but this should not be allowed to detract from the tasks at hand; over enthusiasm can lead to a lack of focus. An ideal leader should have sufficient level of authority to act decisively on committee decisions and to be responsible for budgets and expenditures. At the same time, the leader must have sufficient technical expertise to understand key issues.

4.10.2 Following Process

The success of any plan will ultimately depend on developing and adhering to a process. Some plans are more complex than others and it is recognized that "one size doesn't fit all". However reference to the Provincial Framework is highly recommended when first establishing a process. Situational awareness is important and early development of a set of goals and specific tasks is very useful if progress is to be accurately tracked. To the extent possible, reliance should be placed on available scientific data, highlighting the importance of gathering as much baseline information as possible given cost and time constraints. However, following process doesn't negate taking advantage of early opportunities to implement *ad hoc* improvements to air quality (e.g. the 'low hanging fruit') as the plan is being developed.

4.10.3 Effective Communications

Early support and engagement of the community is important and involves an ongoing commitment to inform all stakeholders of their individual roles and responsibilities if the plan is to work. Communication includes local education programs and any outreach activities focussed on marketing behaviour change, ultimately aimed at improving air quality. It is suggested that these activities may best be coordinated by a committee member with a background in public relations.

4.10.4 External Support

The current focus on sustainability is expected to be a driver for significant changes to environmental legislation, some of which will undoubtedly involve periodic review and changes to acceptable limits for clean air. It is therefore unlikely that new airsheds will be able to develop and implement plans without some sustaining level of financial and technical support from external sources whether from the public or the private sector. Even in the absence of budgetary constraints, the need for technical and regulatory support for air quality management will continue in the foreseeable future.

5 CONCLUSIONS

This section summarizes recommendations identified during the review. It incorporates comments and suggestions observed by respondents to the questionnaire, during interviews with selected airshed committee members and MoE representatives in addition to those made by the author. Recommendations are made both to the Province (as indicated by a bullet taking the form of the Provincial flag) and to members of airshed committees or those having an interest in planning (indicated by tick marks). A few comments and suggestions from respondents are also provided.

5.1 FINANCIAL AND TECHNICAL SUPPORT

It was noted earlier that airshed planning is still evolving. Scientific developments in air quality, especially studies relating to human health effects will continue to advance our understanding of the subject. Emerging issues and increasing awareness of current problems in addition to changing environmental regulations will put additional pressure on regions having poor air quality to implement management plans to rectify the situation.

 **The Provincial Government should remain active in airshed planning by providing technical and professional assistance through the Ministry of Environment regional offices, and by providing both monitoring and financial support.**

 **The Provincial Government should provide airshed groups or communities with estimates of approximate costs for potential airshed activities to guide plan development and implementation.**

 **The Provincial Government should maintain a presence on all airshed planning committees, providing support and guidance as appropriate to maintain progress towards establishing clean air objectives.**

5.2 SCIENCE BASED DECISION MAKING

Section 2.3 lists the concepts on which the provincial framework for airshed planning is based. Missing from that list is the application of science to the process. The technology and quantitative methods associated with compiling emissions inventories and conducting dispersion modeling are complex and often expensive. Ambient monitoring, database maintenance, statistical assessments and any additional research all rely on science for their contribution to air quality management. A successful airshed committee should attempt to realize the full potential of its scientific data by using them to make sound decisions.

In general science based decision making is being followed, but occasionally risks are being overlooked and replaced by a 'jump to cause' mentality. This is the human tendency, common to any multi-stakeholder problem solving exercise, to discard facts or scientific evidence in favour of perceptions or pre-conceived ideas relating to the cause or solution of a given problem. See also the discussion of risks associated with false assumptions, section 4.4.1.

 **The airshed planning framework should be amended to emphasize the importance of science based decision making as a fundamental concept.**

-  **Critical decision making steps in airshed planning, particularly those based on scientific input, should be overseen by an external (unbiased) facilitator. Recognizing the need to maintain public credibility it is further suggested that any significant research efforts conducted on behalf of an airshed committee be submitted to an impartial peer group for review.**
- ✓ **Regardless of complexity, airshed planning efforts should involve the early identification of a list of critical steps leading to tangible targets. This will result in a more focused approach and provide a measure of progress during the implementation phase of the plan.**

5.3 AIRSHEDS AND COMMUNITY REPRESENTATION

Not surprisingly, large airshed committees are more cumbersome and pace of progress tends to be slower than with smaller committees particularly where decisions are made by consensus. By extension, airsheds which encompass several communities spend more time working to achieve consensus and seeking common approaches to solutions than those with fewer committee representatives. The Sea-to-Sky airshed, as an example encompasses eight communities (in whole or in part).

- ✓ **A potential means to avoid this may be to engage municipalities through a separate outreach program as early as possible in the planning process. The object would be to emphasize the benefits of coordinated efforts and mutual cooperation and possibly to set ground rules for decision making. An airshed subcommittee to address municipal issues may be warranted.**

5.4 THE VALUE OF LEADERSHIP IN MAINTAINING MOMENTUM

Any roadblocks resulting in a reduction of progress have a tendency to lead to frustration. This in turn can lead to ‘committee fatigue’, a term coined by a regional MoE meteorologist during one interview. This emphasizes the need to maintain momentum especially during plan development but it must also be recognized that the plan is not an end in itself. A significant level of effort goes into putting the plan into operation and maintaining that operation continues long after the document itself has been prepared and approved.

In this regard, the role of an airshed “Champion” (as discussed in section 4.5) is vital. An experienced leader can help to maintain enthusiasm and pace. For this reason, continuity of leadership is important especially during development and the early stages of implantation.

- ✓ **Selection of a team leader should give due consideration to maintaining continuity. If the leader is elected then his or her term of office should be long enough to allow sufficient time to oversee both the development and implementation of the plan.**

5.5 PUBLICIZING AIRSHED ACTIVITIES

Section 4.7.1 discusses the importance of effective communication in seeking engage public support and maintaining their interest in airshed activities. Most airshed committees use the internet as their primary means of disseminating information to the public. During the review it

was noted that some web pages were not being updated on a routine basis and others carried a mix of current and outdated information.

 **At present there is no consistent method applied to resolving public issues relating to air quality e.g. odour complaints or poor visibility. A common approach should be taken to address citizens' concerns in regions where there has been a history of poor air quality. Publicizing appropriate ministry contacts may be sufficient.**

 **Little information was available to evaluate level of interest in airshed activities. A common protocol should be implemented for all current and future airshed committees to monitor trends in website activity (e.g. website 'visits' or 'hits') as a means of gauging local interest.**

✓ **Regular communication with a commonly identifiable brand, (logo or textual theme), is recommended; information should be both fresh and informative.**

✓ **Community outreach programs and public education efforts lend themselves to easy incorporation into regional airshed communication programs.**

✓ **Establishing a public relations position on the airshed committee, while adding some additional cost, may result in benefits derived from eliminating duplication and by applying a 'one window' approach to coordinating airshed, public outreach and education activities.**

5.6 ENSURING CONSISTENT REGULATORY OBJECTIVES

In regions where multiple activities are taking place there is a risk that 'best management practices' for those activities will not necessarily be consistent with improving local air quality. In the Okanagan, Similkameen region, burning from forestry and agricultural activities, dust from gravel pits and hydrocarbons from asphalt plants all contribute a portion of emissions to the regional airshed. A point raised during an interview with an airshed committee representative suggested that, some Provincial Government departments may unwittingly be promoting practices that are counter to clean air objectives and airshed planning efforts in the region.

 **A cross-ministerial *ad hoc* panel should be looked at as a means to establish ways of reaching a common goal of minimizing impact on regional air quality in the Province.**

APPENDIX 1 SUMMARY TABLE

	Metro Vancouver	Whistler Airshed	Sea to Sky Airshed	Merritt	Prince George	Bulkley Valley - Lakes District	Williams Lake	Quesnel	Grand Forks	Regional District of Okanagan - Similkameen (RDOS)	Central Okanagan (RDCO)	North Okanagan (RDNO)	Fraser Valley Regional District AQMP
Principal Issues													
A Issue driven or B pro-active	A	B	B - Development is expected to be significant and likely to cause a deterioration in human health. Trends indicate that current air quality may already have a health impact.	A	A Prince George has perennially ranked among communities in BC with poor air quality. In particular, particulate matter (PM10, PM2.5) and odour are significant issues.	A	A	A	A - Grand Forks has for years exceeded the PM2.5 standard	A and B	A	A	A
Nature of the current problem(s)	Industrial, commercial and institutional	Currently Whistler has not encountered any air pollution issues. Airshed plan aims to prevent any from occurring in the future. Fossil fuel combustion recognized to be a potential future area for concern.	Mobile, residential, industrial. Currently few issues but concern for future air quality resulting from regional growth and tourism.	Chief objective is particulate reduction - both dust and smoke. Main sources are residential (wood stoves), beehive burner, vehicles and forest fires (controlled burns and natural).	Industrial, residential. Topography of region has a significant effect on local air quality.	Chief objective is particulate reduction. Sources include beehive burners, regulated industrial (Smithers Newpro mill), forestry (burning), agriculture land development, wood burning stoves / back yard burning and road dust.	High levels of fine particulate pose concerns to human health. Although waste wood burners (beehive burners?) were phased out in the 1990s there is still room for improvement.	Rated worst air quality in BC in 1998. Many pollution sources and topography not conducive to dispersion.	Elevated PM identified during 1990s. Industrial emissions, residential, engine emissions, dust considered main contributors. Topography and regional meteorology compound the problem. Industry apportionment in effect as of 2006 only 12 mg/m3 of PM2.5	Specific air quality issues exist in the region and it is recognized that future growth may potentially result in deterioration of air quality. Burning (garbage, wood waste, garden waste), engine emissions and dust.	Primarily particulate drive (P.7) Overall objective to improve air quality. Three strategies: Reduce emissions from major sources. Enhance air quality information and public awareness. Facilitate air quality research to achieve air quality goals.	Ministry of Water, Land and Air Protection in 2002 labeled N. Okanagan as an airshed in which air quality had degraded.	Ozone and inhalable particulates are chief concerns although all common pollutants are addressed.
Population of Region	2,249,725 (2,900 sq km)			8,000		30,000	20,000	24,500	4,150	80,000 (11,000 sq km)	173,173 (2,956 sq km)	7,900 sq km.	230,000 (1998)
Pollutants of chief concern													
CAQs	Yes	Yes	Yes	No	Yes	No	Yes	Yes		No	Yes	No	Yes
TPM and dust	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Secondary PM	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Ground Level Ozone	Yes	Yes	Yes	No	Yes	No	Yes	No	No	No	Yes	No	Yes
Odour management	Yes	No	Yes	No	Yes	No	No	No	Yes	No	No	No	Yes
Other		Vehicle emissions							TRS	Engine emissions		No	ODS and HAPS
GHGs incorporated?	Yes	Yes	Yes	No	No	No	No	No	No	No	Yes	Yes	Yes
Sustainability addressed?	Yes	Yes	Yes	No	No	No	No	Yes	Yes	No	Yes	No	No
Visibility issues?	Yes	No	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes
Incorporation into other regional plans?	Yes	Yes	Yes	No	Yes		No	Yes	Yes	Yes	Yes		
Airshed Planning Group													
Airshed committee established?	Yes	Yes	Yes Started 2005	Yes	Yes. The initial committee structure (predecessor to PGAIR) was established in 1995. A technical committee (now the PGAIR Monitoring Working Group) was established in the mid 1980s.	Yes BVLV Airshed Management Society (BVLV AMS) established 2002	Williams Lake Air Quality Roundtable	Yes - Quesnel Air Quality Round Table (1999)	Yes Started 2006 and reformed in 2008	Yes - Established 2001. Operated until 2008 as the "Air Quality Committee" (renamed Environment Committee in 2009).		Yes - Established 2005 but lost momentum. Did not respond to questionnaire.	Air Quality and Environment Committee
Does the committee have a "champion" who is also a local Government member?			No A champion for each action is being sought. (Early stages of implementation).		Yes; PGAIR has two representatives from the City, the Environmental Coordinator and Environmental Supervisor, the former of whom is also the Vice-President of PGAIR and devotes substantial time to PGAIR. Neither representative has total authority over air quality matters (they must seek direction/approval from City Council), but City Council (including Mayor) have been supportive of AQ initiatives in the past and are expected to continue or improve this in the future (new Mayor is attuned to AQ issues). MOE also plays a significant role on PGAIR (current PGAIR President and Secretary are MOE representatives and they contribute substantial time to PGAIR)	No - during the planning process we used a "broad constituency" approach and got participation from all sectors/stakeholders. We do, however, have a board member who represents local gov (city council).	Yes	Yes	Yes Chairperson is a councillor and two other elected officials serve on the committee	Yes. Air Quality Committee is part of the RDOS Board Committees with stakeholders including elected officials - originally started as a Citizens Group - with a Board Director acting a Chair		Not known.	
Number of people involved?	Undetermined	32	One or two reps. from each of 6 municipalities, regional district, BC Govt. Other groups represented at meetings include local regional residents.	16	18 members/directors (and 2 vacant seats), 1 employee (Air Quality Management Coordinator)	9 (8 directors and a hired facilitator) as at 2008.	13	19	Approximately 20	26 stakeholder groups identified.	7 (agencies).		8 (14 including alternates)
Membership trends?	Undetermined	Undetermined	Has remained constant since committee was established.	Undetermined	Grown	Declined since committee was first established	Undetermined	Remained constant	Public interest waned and some stopped coming. Those who remained have accomplished a great deal.	Stakeholders not yet determined for 2009	The Air Quality Committee was disbanded with the incorporation of the Westside District Municipality in December 2007. Air Quality issues are now being discussed by the Governance and Services Committee. Link to Regional Board and Committee Schedule or Governance and Services Committee webpage.		Undetermined

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Stakeholder groups			Bowen Island, Gibsons, Lions Bay, Squamish, Whistler, Pemberton, SLRD and MoE are the core members. Squamish First Nation, Lil'wat First Nation, Howe Sound Pulp and Paper, Whistler Transit, Vancouver Coastal Health, Ministry of Transportation, Metro Vancouver, West Vancouver, BC Hydro, BC Ferries and VANOC attend meetings and/or receive information about the AQMP.		City of Prince George (2), Regional District of Fraser-Fort George, Ministry of Environment (2), Ministry of Transportation & Highways, Northern Health Authority, Canfor Pulp Limited Partnership, Husky Oil, Carrier Lumber, Pacific Bioenergy, Columbia Bitulithic, Chamber of Commerce, Fraser Basin Council, Peoples' Action Committee for Healthy Air, University of Northern British Columbia, 2 public members; vacant spots (in progress of being filled) are for CN Rail and local First Nations (Lhedli Tenneh)	Board members represent: forest companies, MOE, local gov, general public, concerned citizens (NGO)	Tolko Industries Ltd., City of Williams Lake, Cariboo Fire Centre (Ministry of Forests), MoE, EPCOR Power Plant, West Fraser Timber Co. Ltd., Interior Health, Interior Roads, Pinnacle Pellet Ltd., Cariboo Regional District, Jackpine Group, Ministry of Transportation	D. Havens - Quesnel Environmental Society, B. McLean - Quesnel Waste Disposal Ltd. and West Fraser Mills Ltd., J. Jensen and K. Spencer - Argo Road Maintenance, M. Dunleavy - Ministry of Forests, A. Dalgleish - C & C Wood Products Ltd., D. Alexander and D. McCulloch - Weldwood of Canada Ltd., T. Christy - Cariboo Pulp and Paper Co., G. Gillette and A. Mothenwell - Cariboo Regional District, I. Lindsay - Tolko Industries Ltd., M. Doyle, R. Paull, R. Raynor, and W. Semenoff - City of Quesnel, B. Mahil and M. Van Aert - Quesnel River Pulp Co., E. Plain, A. Trimble, and N. Zimhelt - Ministry of Water, Land and Air Protection, B. Buckham and G. Duchaine - HMC Services Inc., R. Keith - Slocan Forest Products Ltd. (CANFOR), W. Wiebe - Ministry of Transportation, L. Sales - North Cariboo Share Our Resources Society, S. Newell - West Pine MDF	Grand Forks City Council, Regional District D, Regional District C, Ministry of the Environment, Ministry of Highways, Ministry of Forests, Interior Health, Emcon, Interior, Roxul, Unifab, Selkirk Paving, Pacific Abrasives, Boundary Agricultural Society, Wood Stove coordinator, Youth Alliance Climate Change Facilitator, Selkirk College, Grand Forks Medical Staff, Grand Forks Chamber of Commerce, Advance Orchards, Boundary Naturalists Society, Boundary School District, BC Lung Association, Concerned individuals	Member of the public (2) Agriculture (2) Ranch and Tree Fruit, Interior Health, MoE, MoF			
Are regular meetings held?			Yes (three meetings in 2008 - two scheduled for 2009)		Yes; monthly	Yes - quarterly in addition to an AGM	Yes - biannually	Yes - biannually during implementation	Yes monthly	Yes monthly			
Are meetings well attended?			Yes		Yes; a quorum of 60% of members is required for business to be conducted	Yes - but general (ex. board membership) AGM attendance has been disappointing	Yes	Yes	Yes	Yes			
Contribution of external funding \$\$ or %\$\$\$	Undetermined	Undetermined	Varies by year. Approx. 33% from municipalities and regional district in 2008	Undetermined	Funding contributions vary from year to year; for 2007-09, funding for Phase II AQMP, including Coordinator salary but excluding Working Group initiatives and any in-kind contributions, was/will be provided by MOE (approx 33%), BC Lung Association/MOE (approx 12%), City (approx 35%), Regional District (less than 1%), Northern Health Authority (approx 2%), various industry partners (approx 18%)	MOE 90% BC Lung 2% Northern Health 2% Local municipalities 2% BC Transit 0.5% Industry 3% Local Credit Union 0.5%	MOE 37%, HRDC 20%, City & CRD 42%, MOH 1% (not including in kind)	MOE 37%, HRDC 20%, City & CRD 42%, MOH 1% (not including in kind)	Municipality 90% Regional District 10% This was the costs of creating the plan. Implementation of the plan requires MoE, industry, and the community to make investments	\$5000 for airshed planning and implementation - each year from 2001 to 2007			Undetermined
Total annual funding needs			Approx. \$67k 2008 (includes MoE in kind costs). Reduced for 2009		Annual funding requirements vary from year to year, depending on the programs and projects to be carried out. For 2008-09, total budget was approx. \$250,000 (including Coordinator salary but excluding Working Group initiatives)	Approx. 20K / year (not including the pilot woodstove exchange program (\$33K/year) and the MOE's custom venting forecasting service (\$30K/year funded 50% by MOE and 50% by industry). When developing the plan we probably spent approx \$150K over 2 years.		50,000/year over 5 yrs. for plan development	Committee has an annual budget of \$15k.	2007 - \$130,000 tax requisition			
Public Outreach													
Has a communications strategy been developed?			No		Yes	Yes The website is the primary communications tool.	Yes	Yes	Yes	No - but it has been determined that public education is a keystone to the RDOS AQ plan.			
Has a phone hotline been implemented to address public concerns (odour / visibility complaints)?			No Contact with regional MoE office is encouraged if there are AQ issues of concern.		PGAIR website includes email links; complaints called into MOE and/or City	Yes But only during the planning stage. Now the website includes contact info. for the AMS facilitator and for MoE staff	No - Complaint resolution is the responsibility of MoE	No - Complaint resolution is the responsibility of MoE	No				
Have educational programs been implemented?			Yes		Yes: (1) booth at local trade show and local mall for anti-idling campaign (2008, planned for 2009); (2) booth at local mall and trade show planned for 2009 Wood Stove Exchange Program, Anti-Idling Program; (3) Booth planned for 2009 Clean Air Day; (4) Public symposium planned for 2009 after completion of latest scientific study		Yes - See section 5.2.8 of plan for items selected for implementation. Sporadic media releases.	Yes - See section 5.2.8 of plan for items selected for implementation. Sporadic media releases.	Progress reports and planning activities published and available to the public.	Yes			

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Activities	Strategy #2 is to develop local solutions to local issues (involving public input and action) within the regional airshed. Strategy #3 is to enhance air quality information and public awareness. Integrated episode advisory and management programs.	Outreach coordinator to be part of the implementation team. See pages 55-56. (Not sure of current status).	Cross airshed community challenge. Secure funds for education materials. Promote energy saving devices including programmable thermostats etc.	Outreach activities recommended in the plan (P. 15 and others) but no evidence that they have been implemented.	Anti-idling campaign. Community odour study 08-09. Vehicle emission testing clinic. PG AQIC to develop and promote public awareness of air quality via brochures, website and presentations. Promotes proper use of wood burning appliances. Recommends enforcement of nuisance clause of clean air bylaw.	Yes - annual Burn Operators Forum, AGM, Clean Air Day activities, many trade shows, attendance at local municipal council meetings; and many other activities associated with the woodstove exchange program.	Public involvement has been encouraged throughout. Public interests are represented at the Roundtable. Educational programs are ongoing. Public info. brochures on air quality - anti idling. Education sessions on outdoor burning and woodstove exchange program. Open houses etc.	Public education program established.	Idle Free (pledge program). Burn it Smart. Woodstove Exchange program. Council recently passed an anti-idling bylaw	Burn it smart. Woodstove changeout program. Recycling programs. Presentations, events and publications.	Wood stove nuisance bylaw passed. Land clearing and backyard burning ban, open burning education program. Go green commuter challenge. Natural yard care program. Promotion of new AQHI.		Public awareness is addressed in the final recommendation #44. Specific activities not detailed in the plan.
Are events held to encourage public interest and participation?			No. An e-newsletter is available to anybody who signs up through the website (sign up required for free subscription) and various public events were attended by the Idle-free ambassador working in the corridor with core member municipalities in the summer of 2008.		Yes. Website (ongoing), Wood Stove Exchange programs (2008, 2009), Anti-idling campaign (including vehicle emissions clinic) (2008, planned for 2009), vehicle emissions clinic (2005); scrap-it is being examined by City and PGAIR			Yes	Yes "Commuter Challenge" and "Burn it Smart"	Yes			
Number of Reports Issued	Undetermined	Undetermined	Undetermined	Undetermined	All studies requisitioned by PGAIR, as well as all meeting agendas and minutes, are published on the website	Undetermined	Undetermined	Undetermined	Undetermined	Reports not issued	Undetermined		Undetermined
Number of Events Held	Undetermined	Undetermined	N/A	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined		Undetermined
Airshed Website?	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes. Developed by SENES with committee volunteer assistance	No		Yes
Hyperlinks to websites and / or AQMP documents	http://www.metrovancouver.org/services/air/management/Pages/default.aspx	Not applicable	http://seatoskyairquality.ca/	Not applicable	http://www.pgairquality.com/	http://www.cleanairplan.ca/	http://www.williamslake.ca/files/4NLAirshed_Mgt_Plan_Final.pdf	http://www.city.quesnel.bc.ca/LivingInQuesnel/AirshedMgmt/qa/irshedmngt.asp	http://www.city.grandforks.bc.ca/air/	http://www.rdos.bc.ca/	http://www.regionaldistrict.com/docs/boards_committees/AirQualityManagementPlan.pdf		
Recently updated?	Yes	Not applicable	No. Some updates in 2008 but currently in need of a full update.	Not applicable	Yes. Last update was mid-January 2009	Yes - Portions of site updated regularly (every few weeks)	Not applicable	Yes - within last 6 months	Yes. Additional update scheduled for early 2009	Yes	Not applicable		
Real time AQ monitoring displayed?	Yes	Not applicable	Yes	Not applicable	Yes	No	Available via MoE website: http://a100.gov.bc.ca/pub/air/air_summary	Yes - links to AQHI	Yes	No	Not applicable		
Hit Counter	Not displayed	Not applicable	No	Not applicable	Not externally; website statistics are to be obtained from our service provider (in progress; numbers to follow)	Unsure	Not applicable	No	No	No	Not applicable		
Public opinion poll results	Undetermined	Undetermined	Undetermined	Undetermined	No	Events like the Forum and the AGM have records. Some others may also have records - our facilitator (Laurie Gallant) may be able to provide specific statistics	Undetermined	Yes	Participants in Commuter Challenge available. Public awareness surveys have been conducted.	Number of tickets entered into a draw help determine numbers attended	Undetermined		
Have surveys been conducted to gauge public awareness of committee activities?	Undetermined	Undetermined	No	Undetermined	No	Yes. Surveys were conducted under the Woodstove Exchange program	Yes. Surveys were conducted under the Woodstove Exchange program	Yes. Surveys were conducted under the Woodstove Exchange program	Undetermined	No	Undetermined		
Airshed Plan Development and Implementation													
Year of Plan	2005	2004	2007 (?)	2007	2006 (Phase 2)	2006	2006	2004	2008	2006	2007		1998
Have goals been established?	Yes. All relate to reduction mechanisms but lack clear performance measures.	Yes	Yes. Targets and indicators are specific in many cases. 18 actions documented. All relate to reduction mechanisms but lack clear performance measures (targets and dates).	Ongoing - some recommendations contingent on PM2.5 monitoring availability (not sure whether this has been implemented).	Emission inventories currently underway to inform decision on reductions.	Yes. All relate to reducing burning of forest debris, beehive burners, sawmill waste, backyard burning.	Clearly defined objectives for PM2.5 / PM20 over time.	Yes	Yes. All relate to reduction mechanisms but lack clear performance measures.	Yes	Yes. All relate to reduction mechanisms but lack clear performance measures. Very similar to GVRD Plan strategies.		Yes
Has a formal emissions inventory been conducted?	Yes	Yes	Yes (1995). Major sources identified and emissions quantified.	Yes	A micro-emissions inventory, of PM10 and PM2.5, is currently being completed by the PGAIR Research Working Group (from 2005 data) and an odorous emissions inventory is in progress. A previous PM emissions inventory was conducted in 1995 for 1995 data. Major sources identified and emissions quantified.	Yes (2004). Major sources identified and emissions quantified.	Yes (2002)	Yes (2001). Major sources identified and emissions quantified.	Yes (2006) SENES with community support (includes GHGs)	No? (Left message with Janice Johnson to confirm)	No		Yes

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Studies conducted (dispersion modeling, health studies etc.)?	Numerous including comprehensive emissions inventories, socio-economic studies, partner in Georgia Basin Action Plan (with EC) and the Georgia Basin Puget Sound Ecosystem Conference (scheduled for 2009).	Population, energy and emissions forecasts to 2020.	No Ambient air quality reporting has been by MoE (sic.) Various permit holders may have been required to assess impacts as part of the permit application process.	Yes - statistical trends of historical air quality data monitoring particularly PM10 and PM2.5.	Yes. In addition to previous studies carried out by PGAIR members and others, recent studies requisitioned by PGAIR are: (1) Wind sector analysis (Fudge & Sutherland, 2004); (2) Chemical Speciation/PM2.5 Source Apportionment Study (STI, 2008), (2) Dispersion Modeling (Spagnol & Jackson, in progress). PGAIR is also on the project team for a study (Understanding the Spatial Distribution of Ambient Fine Particulate Matter in Prince George, BC) to be carried out by the Northern Health Authority that will, among other things, assess population exposure of residents to wood smoke or traffic hotspots	Yes - Dispersion modelling has been done; UBC and other universities are currently working on a woodstove and health study to go with the pilot woodstove exchange program that is underway; cumulative effects analysis is ongoing and is included as various actions in the plan are implemented.	Yes	Yes - CALMET / CALPUFF modeling.	No But dispersion modeling planned for 2009	No	No		Several including human exposure to ozone monitoring, visibility and PM2.5, atmospheric deposition to snowpack (with EC).
Do goals include GHGs and sustainability efforts?			Yes - only as broad goals.		General GHG/Climate change efforts are included in Recommendations 26 & 27 of Phase II AQMP, but no specific GHG reduction targets are included	No	Yes - GHGs (but only as co-benefits) and sustainability (economic & environmental)	Yes - GHGs (but only as co-benefits) and sustainability (economic & environmental)	Yes - A goal of the plan is to create a sustainable economy	No - But climate change is mentioned as well as integrating into other plans - (planning, solid waste...)			
Is the plan incorporated into other local or municipal plans?			Yes - the plan contains specific actions to incorporate the AQMP into other planning processes.		Yes The AQMP is not currently incorporated into the City's Official Community Plan (2001), but AQMP recommendations relating to the City and the Regional District are presented to the City and Regional District, respectively, for adoption and/or action; air quality is also included in the OCP (s. 4.2) generally. PGAIR provided input to a recent OCP review and normally provides comments on local projects with an AQ dimension/impacts	Yes, it is incorporated in a local Bulkley Valley Energy Plan (Energy Center for the North), some local governments are setting deadlines for exchanges of old technology woodstoves, and the Plan is incorporated into some local Official Community Plans (ex. Smithers).	Yes - Incorporated into official community plans	Yes - Incorporated into official community plans	Yes It will be incorporated into the Integrated Sustainability Plan likely to be adopted by Council, spring 2009	To some extent			
Have specific emission reduction goals been identified?			No Indicators and targets are not been related to specific emissions sources. Actions do not address specific types of sources.		Yes. Among the various broad recommendations set out in the Phase II AQMP is a recommendation, adopted in January 2009, to reduce PM10 and PM2.5 levels.	Yes	Yes	Yes	Yes	We cannot measure - so use visibility of smoke as a gauge and there has been some reduction			
Ongoing ambient monitoring?	Yes	NO2, O3 and PM2.5	Yes	No - not available online.		Yes	Yes	Yes	Yes	Yes	Yes		Yes
Changed legislation to reduce emissions / improve air quality?		Restrictions on open burning of garden wastes to two weekends in spring and fall.	AQMP activities have resulted in changes to bylaws. Anti-idling bylaw implemented in Gibsons and planned for other communities.	Recommendation in plan to ban backyard burning but no bylaws are yet in effect to restrict the practice.	No. The recommendation promotes voluntary reduction efforts but, if targets are not achieved by 2013, PGAIR will recommend other strategies (including, potentially, legislative changes or permit amendments)	Yes - BVLV has been the pilot area for the provincial woodstove exchange program (WSEP) which is based on social marketing techniques, and includes extensive public education. We have had many education campaigns under this program (demonstrations and workshops, using our Burn-it-Smart trailer, info booths, preparation and distribution of brochures, colouring books, etc.) In 2008 we also had an anti-idling campaign.	Yes	Yes	Yes Roxul's permit has required modifications to its pollution abatement equipment.	Yes - A burning bylaw has been implemented			

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Milestones in place for implementation?	Yes but no timelines.	2010 and 2020 energy consumption targets but no specific milestones.	Yes The implementation plan has performance measures and the plan itself applies and adaptive management framework	No	Yes . In progress (see Phase II AQMP Work plan)	No - we had the intention to do this; and this will be undergoing review and revision in 2009.	Yes	Yes	Yes	No	No - specific dates for completion not noted		Undetermined
Approximate stage of implementation?	Undetermined	Undetermined	Implementation started in 2008. Currently in process of assessing first year's progress.	Undetermined	Difficult to assess, as many actions are on going and as work plan is an iterative process (so as activities are completed, others are sometimes identified and subsequently incorporated, with milestones). Based on current work plan, approximately half of milestone actions have been completed	Probably 25-50%	On schedule with plan.	On schedule with plan.	Implementation beginning 2009	N/A	Yes - most were implemented in advance of plan. Additional strategies to be implemented between 2007 - 2010.		Undetermined
Have any improvements to local air quality been observed since implementation?			First annual report not yet complete.		Local AQ has improved, based on recent PM10 and PM2.5 levels, but it is too early to determine whether improvements are the effect of AQMP implementation or meteorological factors (or a combination thereof)	No - No measureable improvements. We believe that there are fewer (and less severe) AQ episodes due to open burning by forestry companies; we have increased awareness of road dust issues, and we have changed +/- 325 woodstoves, although we anticipate that total woodstove use has increased as more and more people install woodstoves - causing continued "neighbourhood AQ" issues.	Too soon to determine air quality improvements.	Yes - Burner shutdown, lower ambient levels	Actions already undertaken (Roxul improvements and particle plant has closed) may have resulted in improvements. Awaiting MoE analysis.	Yes - Observed reduction in emissions from open burning and increase in chipping of agricultural wood waste			

APPENDIX 2 TERMS OF REFERENCE

Review of Airshed Planning In B.C.

Purpose

To provide a preliminary review of the effectiveness of airshed plans completed to date in B.C., and provide recommendations on better supporting improvements in local air quality.

Background

Airshed planning is a stakeholder-driven process to coordinate activities affecting air quality in a defined area or airshed. Airshed planning has been supported as a useful means to engage the public and stakeholders and develop local solutions to improving local air quality.

Airshed planning has a lengthy history in B.C., with the following airshed plans drafted and/or being implemented:

- Greater Vancouver Regional District
- Fraser Valley Regional District
- Whistler and Sea-to-Sky Airshed
- Merritt
- Regional Districts of Okanagan Similkameen, Central Okanagan, and North Okanagan, and Valley-wide plan
- Williams Lake
- Quesnel
- Prince George
- Bulkley Valley-Lakes District

Both the province's Air Action Plan and the mandate of the new Ministry of Healthy Living and Sport highlight clean communities as a priority, with airshed planning a mechanism to support this. With the additional focus on airshed planning, and the fact that airshed plans in the Bulkley Valley-Lakes District and Quesnel are approaching 5 years in the implementation phase, a review of the effectiveness of the plans to date would be of immense value to shape future direction and support in this area.

Statement of Work

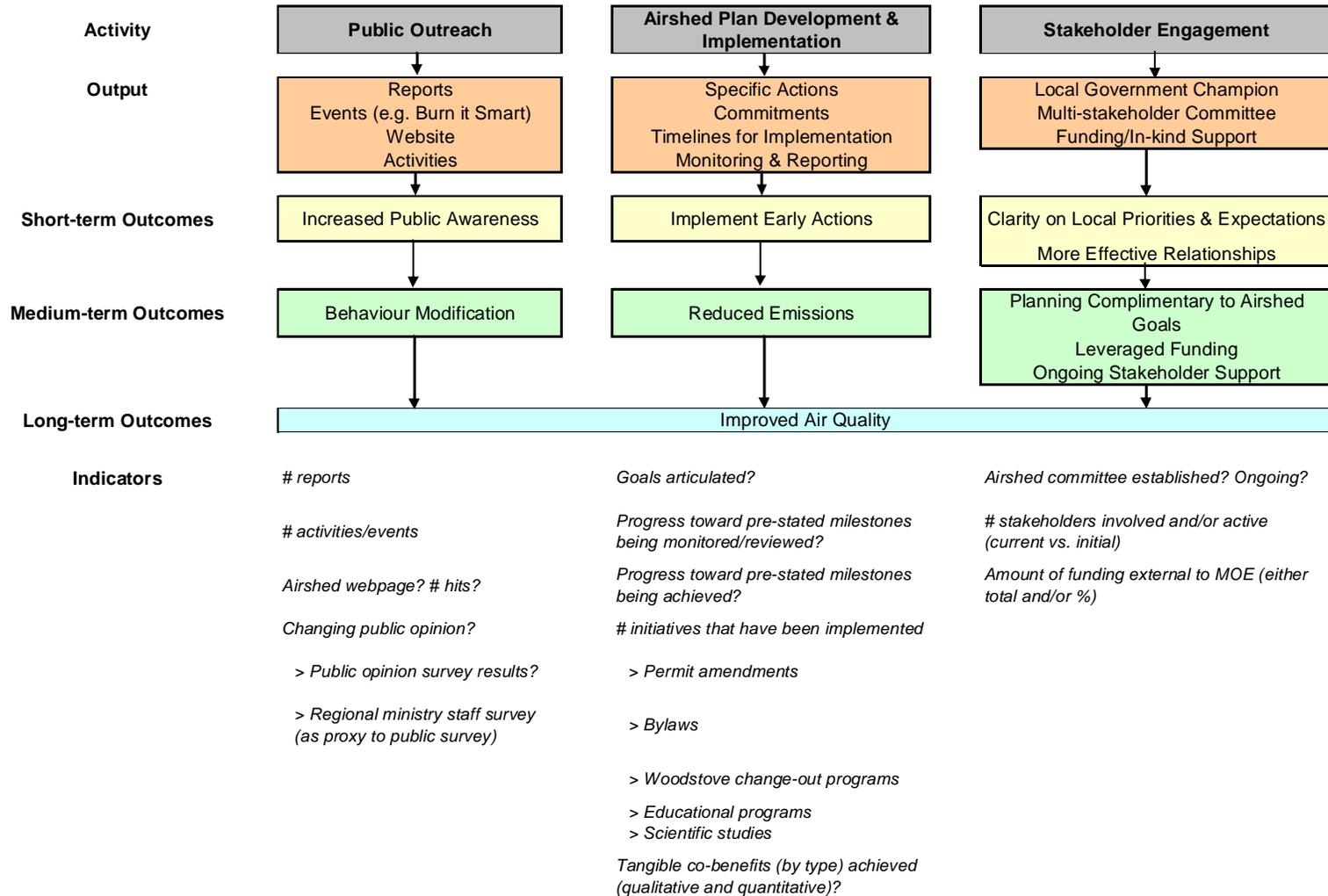
- In consultation with the project team, confirm performance indicators for assessing individual airshed plans. Indicators will include but not be limited to those identified in Appendix I.
- Based on the identified performance indicators, review the airshed plans for communities that include but are not limited to the following: Merritt, Regional District of Central Okanagan and its link to valley-wide plan, Quesnel, Prince George and Bulkley Valley-Lakes District. See Appendix II for links to these plans and others.
- Review air-related activities (e.g. clean air committee, local bylaws, public outreach activities) for one or two other communities that have demonstrated an interest in local air quality, but have not developed an airshed plan (e.g. Cranbrook or Kamloops).
- Based on this review, prepare a summary of:
 - Goals, priorities and key actions of each plan,
 - Achievements relative to identified performance indicators, and
 - Roadblocks that have prevented or limited implementation of airshed plans and achievement of performance targets.
- Provide a discussion on:
 - the main differences between these plans in terms of approach, priorities and scale, where possible identifying broad categories of airshed plans (e.g. on basis of community size or types of emission sources);
 - reasons why some communities with an interest in air quality issues have not developed an airshed plan
 - characteristics of airshed committees that have facilitated the timely development and implementation of airshed plans (e.g. Merritt).
- Provide recommendations on how the provincial government can better support improvements in local air quality through airshed planning and related processes.

Project Schedule and Deliverables

- Work is anticipated to commence upon the awarding of the contract, with a target completion by Mar. 6, 2009.
- The consultant will participate in project meetings with the project manager and project team as required, consult with them and keep them informed of work progress on a regular basis during the project.
- Approximate timelines, to be confirmed with the ministry upon awarding of the contract, are as follows:

Award contract	Nov. 3, 2008
Project meeting with ministry	Nov. 10, 2008
Submit annotated table of contents to ministry	Dec. 12, 2008
Submit 1 st draft report to ministry	Jan 30, 2009
Receive comments on 1 st draft report from ministry	Feb. 13, 2009
Submit 2 nd draft report to ministry	Feb. 20, 2009
Receive comments on 2 nd draft report from ministry	Feb. 27, 2009
Submit final report to ministry	Mar. 6, 2009

Appendix I – Airshed Planning Logic Model and Draft Performance Indicators



Airshed Plans in B.C.

Greater Vancouver Regional District Air Quality Management Plan

<http://www.metrovancouver.org/about/publications/Publications/AQMPSeptember2005.pdf>

Fraser Valley Regional District (upon request)

Central Okanagan Air Quality Management Plan (2007)

http://www.regionaldistrict.com/docs/boards_committees/AirQualityManagementPlan.pdf

Regional District of Okanagan-Similkameen Air Quality Management Plan (2006)

http://www.rdosmaps.bc.ca/min_bylaws/ES/AQ/RDOSAirQualityManagementPlanJune5_06.pdf

Merritt Air Quality Management Plan (2007)

http://www.env.gov.bc.ca/air/airquality/pdfs/merritt_aqmp.pdf

Resort Community of Whistler Integrated Energy, Air Quality and Greenhouse Gas Management Plan (2004)

http://www.whistler.ca/images/stories/sustainability_images/GHG%20information/whistler_int_e_nergy_plan.pdf

Sea-to-Sky Airshed (upon request)

Williams Lake Airshed Management Plan (2006)

http://www.williamslake.ca/files/4/WLAirshed_Mgt_Plan_Final.pdf

Quesnel Airshed Management Plan (2004)

http://www.city.grandforks.bc.ca/air/airshed/Quesnel_Airshed_Report.pdf

Prince George Air Quality Management Plan

- Phase I (1998) http://www.pachapg.ca/temp/links/downloads/air_mgmtplan_final.pdf
- Phase II (2006) [http://www.pgairquality.com/files/pdf/PRAQMP-P2\(2006\).pdf](http://www.pgairquality.com/files/pdf/PRAQMP-P2(2006).pdf)

Bulkley Valley-Lakes District Community Action Plan for Clean Air (2006)

<http://cleanairplan.ca/documents/Complete.pdf>