Comox Valley REGIONAL DISTRICT

Staff Report

DATE: May 17, 2021

FILE: 5280-02

TO: Chair and Directors
Regional District Board

Supported by Russell Dyson
Chief Administrative Officer

R. Dyson

FROM: Russell Dyson
Chief Administrative Officer

RE: **Regional Airshed Roundtable Update (Year One)**

Purpose

To provide the Comox Valley Regional District (CVRD) Board with an update and summary of the first year of the Airshed Roundtable (Roundtable) including the draft vision and goals developed for the Regional Airshed Protection Strategy (Strategy).

Recommendation from the Chief Administrative Officer:

THAT the Regional Airshed Roundtable Update staff report dated May 17, 2021 be received for information.

Executive Summary

- The Regional Airshed Roundtable, was established following direction from the board on September 17, 2019 to create a collaborative framework for improving air quality in the Comox Valley as described in *A Regional Approach to Improve Air Quality and Health in the Comox Valley: Our Proposal* dated August 2019. Ensuing the recommendations for this framework, Pinna Sustainability was retained as the Air Quality Coordinator to work with the Steering Committee and the Roundtable. The first year (May 2020 – April 2021) of the Regional Airshed Roundtable has successfully established the foundation and built capacity for a collaborative approach in the development of a Regional Airshed Protection Strategy.
- Year One principal activities accomplished include:
    - Retaining an Air Quality Coordinator.
    - Establishment and engagement of the Steering Committee which is represented by government agencies, academics, and health authorities involved in managing air quality.
    - Establishment and engagement of the Roundtable which is represented by non-profit groups, private industry, advocacy groups and members of the public. The Steering Committee also participates in the Roundtable.
    - Initiation of the strategy development process through the creation of the draft vision and goals.
- The five Steering Committee meetings and three Roundtable meetings were well-attended and informed the creation of the draft vision and goals for the Strategy.
- The second year (May 2021 – April 2022) of the project will see a broader engagement approach, supported by additional funding financed through the Vancouver Island Health Authority (VIHA) Community Wellness Grant.
- The Regional Airshed Roundtable Year One report by the Air Quality Coordinator is attached as Appendix A.

Prepared by:

D. Mazarura

Daphne Mazarura, BURPl, MEL
Planning and Policy Analyst

Concurrence:

A. Mullaly

Alana Mullaly, RPP, MCIP
General Manager of Planning and Development Services

Government Partners and Stakeholder Distribution (Upon Agenda Publication)

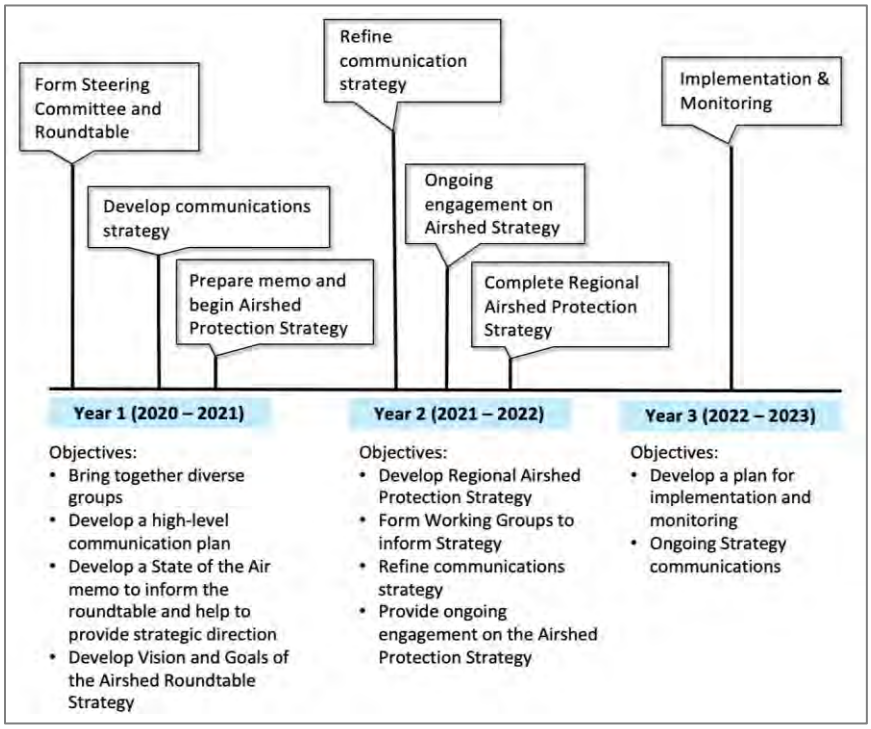
City of Courtenay	✔
Town of Comox	✔
Village of Cumberland	✔
K'ómoks First Nation	✔
Air Quality Coordinator - Pinna Sustainability	✔

Background/Current Situation

Improving air quality is a strategic priority that was identified by the board in January 2019, and is also a key initiative under the Regional Growth Strategy Service. The Comox Valley struggles with poor air quality emanating from high levels of fine particulate matter that is further exacerbated in the winter months. The concentration of air pollutants in specific areas such as valleys can cause serious impacts on human health. Improving air quality in the region is complex due to personal choices, socioeconomic inequities, different levels of government regulation and cultural values. The Regional Airshed Roundtable was developed as a regional framework in 2020 to address air quality in the Comox Valley. The three year timeline was selected to provide a sustainable and effective engagement approach in the development of a Regional Airshed Protection Strategy.

<u>The Regional Airshed Roundtable Structure and Year One Achievements</u>

Figure 1: Objectives and Process for the Regional Airshed Roundtable



(Pinna Sustainability)

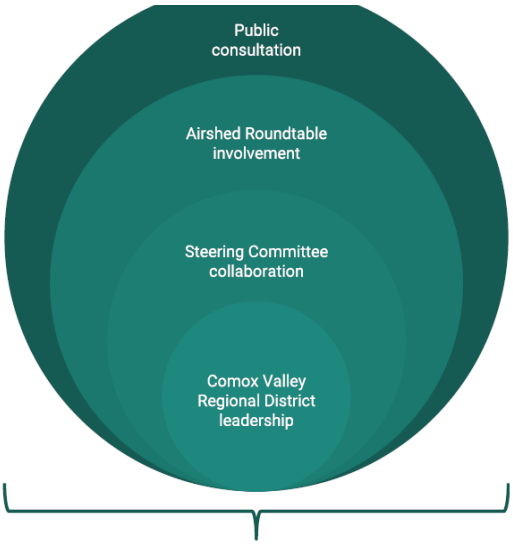
Figure 1 above provides an overview of the objectives and process for the three year project timeline. The first year of this initiative resulted in the establishment and collaborative engagement of the Steering Committee, the Roundtable, and development of the draft vision and goals for the Strategy. A detailed account of the Roundtable's first year is available in the Airshed Roundtable Year One report (Appendix A). The established Regional Airshed Roundtable Structure and Year one engagement are summarized as follows:

CVRD staff convenes the processes of the Roundtable, obtains and allocates resources and liaises directly with the Coordinator.

The Air Quality Coordinator facilitates the Roundtable process, coordinates the Roundtable activities and leads in the development of the Strategy.

The Steering Committee provides technical expertise, champions and supports development of the Strategy. The Steering Committee is comprised of staff from the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development, the Ministry of Environment and Climate Change Strategy, Vancouver Island Health Authority, Vancouver Island University and local government representatives from the City of Courtenay and the CVRD.

Airshed Protection Strategy Group Structure



The Steering Committee met five times in the first year of the project to:

- Prepare a Terms of Reference and set of Guiding Principles for the Steering Committee and the Roundtable;
- Develop a State of the Air Memo;
- Develop a communications plan and media approach;
- Develop, in consultation with the Roundtable, a draft vision and set of goals for the Strategy; and;
- Provide feedback on key decision points to the Air Quality Coordinator and CVRD staff.

The Roundtable is a collaborative group of representatives from the private industry, regional fire services, the Chamber of Commerce, advocacy groups, non-profit groups and members of the public (including municipal and electoral area representatives). The Steering Committee is also part of the Roundtable. The Roundtable identifies issues and helps generate solution ideas. The Roundtable operates under a terms of reference which includes the following objectives:

- To help identify issues and establish shared priorities.
- To offer potential solutions as identified.
- To help inform public policy on clean air in the region.
- To share information with the organizations/ groups that they represent.

The Roundtable met three times in the first year to:

- Provide input on the Terms of Reference;
- Draft the vision and goals;
- Discuss the complexity of air quality and help identify issues and establish shared priorities. The Roundtable also plays a role in reporting out the work of the Roundtable to their organizations.

CVRD staff convenes the processes of the Roundtable, obtains and allocates resources and liaises directly with the Coordinator.

Engagement Approach and Key Deliverables:
Thorough engagement and understanding of the Roundtable is required because of the diverse representation, knowledge and understanding of the members. In addition to the meetings of the Steering Committee and the Roundtable, it was necessary to create and share resources and materials for a supportive process which included the Terms of Reference and Guiding Principles. An information repository was created to address timing constraints, improve efficiency and accessibility to more detailed information on topics identified by the Roundtable. Additional engagement activities included presentations on various topics and initiatives delivered by Steering Committee representatives and CVRD staff. Also, surveys and dialogue helped build the capacity of the Roundtable and elicit themes for strategy development and working group topics.

The broader public can keep informed of activities through the Airshed Roundtable Project page on Airshed Roundtable Project | Comox Valley Regional District (comoxvalleyrd.ca). The Roundtable meeting materials such as the State of the Air Memo, meeting slides and presentations are available on the project page.

Airshed Protection Strategy Draft Vision and Goals:
The vision and goals were developed in alignment to the purpose statement created by the working group that preceded the creation of the Airshed Roundtable stating: "Working together to achieve the best air possible for a healthy Comox Valley." The process also entailed the brainstorming, discussions, surveys and the review of related materials. The condensed version of the draft vision for the Strategy is:

"The Comox Valley has clean air supporting the health of all residents."
Goal 1: Achieve measurable reductions in fine particulate matter levels
Goal 2: Effective coordination of our efforts
Goal 3: Educate and involve the community in understanding and reducing the impacts of air pollution

The draft vision, goals and principles of the Strategy will guide subsequent activities of the Roundtable. The detailed draft vision and goals are included in Appendix D of the Year End Report (Appendix A). The process for the vision and goals creation included Roundtable meetings, surveys, reviewing other BC plans and input from the Steering Committee.

Next Steps
The key milestone for the second year is the development of a Regional Airshed Protection Strategy. The Steering Committee, Coordinator and Airshed Roundtable will work towards this development through working groups and broader engagement. The task schedule for year two is available in Figure 4 of Appendix A.

Broader Engagement
Additional funding was secured to enhance engagement and collaboration in the Airshed Roundtable process for year two. The year two engagement strategy will enable broader education, input and collaboration in the strategy development process. This will include further online engagement using the Connect CVRD web site, a public online event, additional collaborative initiatives and support for Working Groups.

Policy Analysis
Part 13 of the *Local Government Act* (RSBC, 2015, c. 1) outlines the purpose of a Regional Growth Strategy (RGS). The RGS is a regional vision that commits regional districts and municipalities to a course of action to meet social, environmental and economic objectives. The legislation is broad enough to address regional matters including air quality. In 2019 the board included air quality as a key project under the RGS Service.

Air Quality has also been identified by the board as a strategic priority, therefore the resources to support the Regional Airshed Roundtable are considered alongside the delivery of other core services.

Options
This report is provided for information.

Financial Factors
This project is housed under the RGS service in which the electoral areas and municipalities participate. The project is supported by an annual amount of $ 30,000 from the RGS service budget. The second year (May 2021 – April 2022) will be supported by an additional $ 20,000 funded by the VIHA Community Wellness Grant which will contribute to broader engagement.

Legal Factors
There are no legal factors related to this report.

Regional Growth Strategy Implications
Clean air is fundamental to human life and healthy ecosystems. The RGS vision statement is impossible to achieve without clean air:

"…As stewards of the environment, local governments, the K'ómoks First Nation, public agencies, residents, businesses and community and non-governmental organizations will work collaboratively to conserve and enhance land, water and energy resources and ensure a vibrant local economy and productive working landscape's."

Clean air also supports a high quality of life through the protection and enhancement of community health, safety and well-being (Goal 7: Public Health and Safety) and protecting, stewarding and enhancing the natural environment and ecological connection and systems (Goal 2: Ecosystems, Natural Areas, and Parks).

The Regional Airshed Roundtable will assist in achieving the overall objectives of the RGS through a collaborative effort to identify and implement actionable steps or advocacy work to improve air quality.

Intergovernmental Factors
Members of the Steering Committee and the Airshed Roundtable include local government staff and representatives from provincial agencies such as VIHA, the Ministry of Environment and the Ministry of Forests, Lands, Natural Resource Operations and Rural Development.

Interdepartmental Involvement
The Planning and Development Services Branch is the project lead with support from Pinna Sustainability and in collaboration with the members of the Steering Committee and the Airshed Roundtable.

Citizen/Public Relations

The Roundtable is represented by non-profits and six members of the general public. The activities of the Airshed Roundtable are shared with the public through the project page. In addition, broader public engagement and materials will be conducted on the Connect CVRD page. A detailed engagement plan will be prepared for year two.

Attachments: Appendix A - Airshed Roundtable Year One Report by Pinna Sustainability

Regional Airshed Roundtable

Year 1 Report

Comox Valley Regional District

May 2021

Submitted to: Comox Valley Regional District

Submitted by: Pinna Sustainability Inc.

Pinna Sustainability

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1. Introduction

1.1 Background

Over the last two decades, an increasing body of evidence indicates that wood smoke can be a significant source of air pollution that can have detrimental health effects to humans. This is highlighted for BC's context in a recent report published by the BC Lung Association which stated that wood smoke is a major contributor to air pollution in BC.[1] Wood smoke contains fine particulate matter called $PM_{2.5}$, a pollutant that can cause chronic and acute respiratory and cardiac diseases, especially among children and the elderly. Major sources of $PM_{2.5}$ include using wood stoves to provide heat in homes, open burning to manage debris and reduce fire risk, vehicles and equipment that serve our daily needs, and more.

In an effort to reduce the levels of $PM_{2.5}$, local initiatives have been implemented such as the Comox Valley Regional District's (CVRD) Wood Smoke Reduction Program, bylaw updates by local governments, and education and outreach initiatives by both the CVRD and local advocacy groups. Despite these efforts, local air monitoring results showed no significant improvement.

Recognizing the severity of the issues, and lack of improvements in air quality, in 2019 the CVRD Board included air quality as a key project under the Regional Growth Strategy service. A multi-agency working group developed a framework for moving forward, which included recommending a collaborative approach to air quality improvement and forming a Regional Airshed Roundtable initiative (the Airshed initiative), as laid out in the report, *A Regional Approach to Improve Air Quality: Our Proposal*.

A collaborative approach was chosen because, as described the *Our Proposal* report:

> "The interactions between the causes, impacts, and potential solutions of poor air quality in the Comox Valley are complex. While we know that there are distinct contributors to elevated $PM_{2.5}$ (mainly attributed to wood smoke from residential heating, backyard burning and larger open burns), the pathways to improving air quality touch on personal choice and behaviours, social norms, socioeconomic inequalities, government regulation, the "tragedy of the commons" and cultural values…
>
> **Improving air quality in the region will require us to align our actions across many individuals and organizations, in order to achieve our goals** [emphasis as in original]."

There is a wide variety of stakeholders with different opinions on how to improve air quality within the Comox Valley. The Airshed initiative works to navigate some of the complexities with air quality management through collaboration, communication and a strategic approach.

[1] BC Lung Association. State of the Air 2017 Report. https://bc.lung.ca/sites/default/files/State%20of%20the%20Air%202017%20-%20merged.pdf

1.2 Airshed Roundtable Objectives and Process

The Airshed initiative is a three-year, collaborative initiative to form and begin implementation of an Airshed Protection Strategy (Strategy). The Strategy's main aim is to improve air quality in the Comox Valley. As the purpose statement created by the working group that preceded this process states: ***Working together to achieve the best air possible for a healthy Comox Valley***.

"Working together" acknowledges that no one organization is ultimately responsible for clean air, but rather, that many must work together to achieve the desired outcome. Although the CVRD is leading this process, ultimately all participating organizations will play an important role in forming and implementing the Strategy.

"Best air possible" refers to measures in the short, medium and long term, with measurable improvements in daily and annual levels of $PM_{2.5}$, reaching consistently lower levels than the BC standards.

In order to achieve these improvements in air quality through a collaborative approach, the CVRD launched the Airshed initiative in Spring 2020 using the framework proposed by the working group. This involved establishing a Steering Committee, establishing an Airshed Roundtable, and retaining an Air Quality Coordinator. The following section describes these roles.

Objectives for the Airshed initiative and the process itself are broken down by year and are summarized in Figure 1 below.

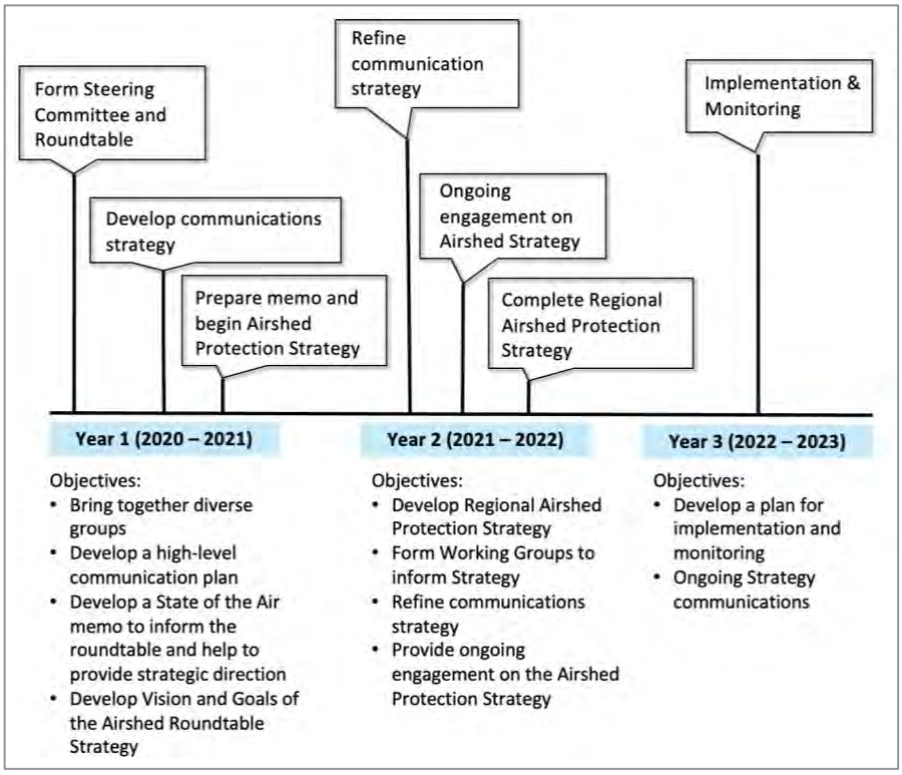


Figure 1: Objectives and process for the Regional Airshed Roundtable by year

1.3 Airshed Initiative Structure and Roles

The Airshed initiative is made up of four entities with different roles. The first group is the **CVRD** who convene the process, obtain and allocate resources, and make the final decisions. The second entity is the **Air Quality Coordinator**, Pinna Sustainability, hired by the CVRD as an external consultant. The Air Quality Coordinator's role is to facilitate process, support strategy development, guide implementation, and establish a process to monitor and report. The Air Quality Coordinator is also responsible for writing the Airshed Protection Strategy based on Steering Committee guidance, Roundtable discussion, and public input.

The third group is the **Steering Committee**, who are made up of government agencies involved in managing air quality. The Steering Committee role is to provide expertise, listen to input, inform recommendations, and champion and support strategies. The Steering Committee meets 8 - 12 times per year, which includes attending the Roundtable meetings.

Finally, the **Airshed Roundtable** is made up of government representatives, non-profit, industry, and members of the public. The Airshed Roundtable role is to identify issues, generate solution ideas, seek common ground, and share information and progress with their networks. The Airshed Roundtable meets 3 - 4 times per year.

Figure 2 displays the above information, along with the role of the **general public**.

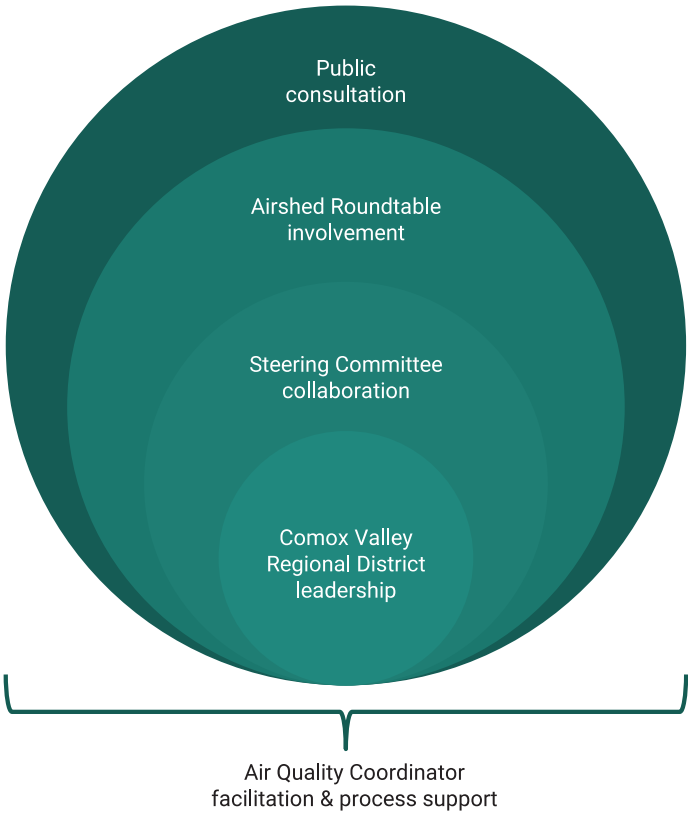


Figure 2: Airshed Protection Strategy group structure

2. Group Formation

One of the first steps in the Airshed initiative was to form the groups responsible for its creation: Air Quality Coordinator, Steering Committee, and Airshed Roundtable. The following section outlines this process.

2.1 Air Quality Coordinator

In April 2020, the CVRD put out a Request for Proposals to hire an Air Quality Coordinator to support the Airshed Roundtable Strategy development. Pinna Sustainability Inc. was awarded the contract in May 2020.

2.2 Steering Committee

The Steering Committee is made up of staff from government agencies and academia who are involved in managing or researching air quality. The following groups were invited to participate in the spring of 2020. Active members of the Steering Committee are in **bold**, while passive members (receive meeting notes and materials) are in *italics*. There are eight active members of the Steering Committee currently.

- **CVRD**
- *Town of Comox*
- **City of Courtenay**
- *Village of Cumberland*
- **BC Wildfire, BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD)**
- **Air Quality Section, BC Ministry of Environment and Climate Change Strategy (ENV)**
- **Vancouver Island Health Authority (VIHA)**
- **Vancouver Island University**
- K'òmoks First Nation

2.3 Airshed Roundtable

Working in partnership with the CVRD, and building upon the suggested stakeholders and representatives outlined in the *Regional Approach to Improve Air Quality: Our Proposal*, the Air Quality Coordinator developed invitations for participation in the Airshed Roundtable.

The following groups were invited to participate in the summer of 2020. Active members of the Airshed Roundtable are in **bold**, while passive members (receive meeting notes and materials) are in *italics*. There are 29 number of active participants in the Airshed Roundtable.

- BC Community Forest Association
- **BC ENV**
- Benett Sheet Metal and Heating
- **City of Courtenay**
- Comox Seniors' Association
- **Comox Fireplace & Patio**
- **Comox Valley Breathe Clean Air**
- **Comox Valley Chamber of Commerce**
- Comox Valley Community Foundation
- **Comox Valley Community Health Network**
- **Comox Valley Nurses for Health & the Environment**
- **Comox Valley Farmers' Institute**
- **Comox Valley Fireplace and Patio**
- Comox Valley Firewood
- **Cumberland Community Forest Society**
- *CVRD's Integrated Regional Transportation Select Committee*
- **Elemental Energy Advisors**
- *Fire Departments (Fire Chiefs Association)*

- First Nations Health Authority
- **FLNRORD**
- **Focused Energy Assessments**
- **Hanock Natural Resource Group**
- **Hearth, Patio, & Barbeque Association of Canada**
- K'ómoks First Nation
- **Manager of Fire Services CVRD**
- **Mid Island Farmers' Institute**
- *Mosaic Forest Management*
- **Norse Heating**
- *Peakflow Energy Solutions*
- School District 71
- **Town of Comox**
- **Vancouver Island University**
- **VIHA (Environmental Health)**
- **VIHA (Public Health)**
- **Village of Cumberland**
- **Six members of the public**

Members of the public were invited to submit a proposal to join the Airshed Roundtable. Six members of the public were chosen by the CVRD based on submissions to join the Airshed Roundtable.

3. Strategy Development Process

Once the Air Quality Coordinator, Steering Committee and Airshed Roundtable were formed, the groups began to meet, build relationships, and begin to develop the Strategy's vision and goals. The date, agenda, and outcome of each meeting during the first year are outlined in the proceeding sections.

3.1 Steering Committee Meetings

Five Steering Committee meetings were held during the first year of the process. The following table provides the date, agenda and outcomes from each meeting.

Date	Agenda	Outcomes
Meeting 1: June 18, 2020 9 members present	• Introductions • Review work completed to date re: air quality • Establish roles and expectations • Review State of the Air Report table of contents • Discuss communications approach • Discuss Roundtable invitations • Next steps	• Updates for Terms of Reference and Guiding Principles document • Updates to State of Air memo table of contents • Confirm Roundtable membership

Meeting 2: August 13, 2020 9 members present	• Review Draft State of the Air Memo • Discuss Roundtable membership procedures • Identify objectives and approach for first Roundtable meeting	• Updates to State of the Air Memo report content • Updates for the Roundtable meeting approach • Members volunteered to present background information at the first Roundtable meeting
Meeting 3: October 14, 2020 8 members present	• Discuss outcomes from Roundtable meeting #1 • Identify objectives and approach for Roundtable meeting #2 • Discuss media approach	• Group happy with first Roundtable meeting • Members volunteered to lead presentations in their topic area of expertise in the next Roundtable meeting (open burning, space heating, and transportation) • Recommendations for media approach
Meeting 4: February 3, 2021 7 members present	• Overview of Roundtable survey input • Review and discuss draft vision and goal ideas developed from the survey input • Discuss feedback obtained from Roundtable members on the Roundtable membership and process, and proposed approach for Roundtable meeting #3 • Proposed updates to the process for Year 2 engagement	• Updates to draft vision and goals document to bring to the Roundtable • In response to feedback from Roundtable participants, discussed and confirmed continuation of the current collaborative format, and endorsed additional communication with Roundtable members as needed to encourage collaboration
Meeting 5: April 13, 2021 7 members present	• Review vision and goal updates based on Roundtable meeting #3 • Working Group proposal as an approach to enable increased discussion among small groups between Roundtable meetings • Roundtable update, including participant process requests • Strategies for Goal 2: Effective coordination of efforts and monitoring	• Endorsed current vision and goals document with minor changes requested • Endorsed proposed Working Group format • Suggested potential public event to highlight links between health and air quality • Strategies section deferred to next meeting due to time limitations

3.2 Roundtable Meetings

Three Roundtable meetings were held during the first year of the Airshed Roundtable process. The following table provides the date, agenda and outcomes from each meeting.

Date	Agenda	Outcomes
Meeting 1: September 15, 2020 30 members present	• Welcome and introductions • Overview of project and process • Expert presentation on Air Quality in the Comox Valley • Facilitated discussion on strengths, barriers, and opportunities • Next steps	• Acquaintance among participating members • List of strengths, barriers and opportunities to bring forward to set the context and to inform development of Strategy vision and goals
Meeting 2: November 19, 2020 30 members present	• Welcome and introductions • Check-in on process and terms of reference • Introduction to collaborative strategy development • Steering committee presentations on 3 topics: Space heating, open burning, and transportation • Break-out groups: informing goal development • Next steps	• Suggested updates to Terms of Reference • Increased awareness of the major sources of air pollution in the region • Input to support development of Strategy vision, goals and values
Meeting 3: March 4, 2020 30 members present	• Welcome and introductions • Steering Committee update • Related initiatives update: Community resiliency investment and FireSmart • Roundtable survey findings • Developing the strategy: draft vision and goals overview • Break-out: Vision discussion • Break-out: Goals discussion • Reconvene and wrap-up	• Detailed input on the vision statement and goals • Informed the identification of guiding principles for the Strategy

3.3 Roundtable Survey and Feedback

Following the second Roundtable meeting, an online survey was implemented to seek feedback from both the Steering Committee and Roundtable members. Primarily the survey sought to collect vision and goal ideas from the two groups, feedback on the Airshed initiative process to date, as well as gauge support for potential Working Groups. The results of the survey helped inform the vision and goals document, as outlined in the next section.

4. Key Outcomes

4.1 Formation of Roundtable and Terms of Reference

One of the first tasks of the Airshed Roundtable was to form a Terms of Reference. Based on the original proposal for this process, as well as consultation with the Steering Committee and CVRD, the Air Quality Coordinator formed a draft Terms of Reference. The Terms of Reference was reviewed and updated based on Steering Committee and Roundtable feedback and is provided as Appendix A.

4.2 Communication Plan and Ongoing Communications

A communications plan was drafted and approved by the board in July of 2020. The plan highlights the objectives and proposed formats for communication with select audiences. This includes social media content, CVRD website updates, and board updates. The Airshed Roundtable meeting materials, including presentations, are available to the general public through the CVRD project website. Further, a shared drive has been created for Roundtable members to access meeting materials and related resources. The communications plan is provided as Appendix B.

Throughout the first year, members of the Roundtable provided feedback related to process of the Airshed initiative. The Air Quality Coordinator maintained regular communication with all members, received input, and brought feedback to the Steering Committee during meetings for guidance on how to address feedback and/or adjust the process, as necessary. For example, the Steering Committee proposed that the Air Quality Coordinator have one-on-one meetings with select members of the Roundtable to hear feedback directly and maintain a collaborative environment.

4.3 State of the Air Memo

A State of the Air memo was completed in September 2020 and was written to provide the background to prepare the Airshed Roundtable for participation to develop and implement a Regional Airshed Protection Strategy. This memo summarizes the current state of the air in the Comox Valley (air quality data, pollutant sources, studies and work completed to date), highlights how air pollutant sources are regulated and managed, and provides examples of what an airshed protection strategy may include. It provides members of the Roundtable a common understanding of this information in preparation for collaboratively developing an airshed protection strategy for Comox Valley. Key messages from this memo and the Roundtable discussions will be communicated with the public during the process, and the memo itself has been made available for download on the project website. The State of the Air memo is provided as Appendix C.

4.4 Strategy Vision and Goals

During the first year of the Airshed initiative one of the main tasks was to develop a set of vision and goals for the Airshed Protection Strategy. The process that was used to develop the vision and goals is outlined in Figure 3 below. The vision and goals document is provided as Appendix D.

Figure 3: Comox Valley Airshed Strategy: method for drafting vision and goals

5. Next Steps

The next year of the Airshed initiative will build on the success of the first year to develop the Airshed Protection Strategy. This includes identifying how to achieve the goals laid out in the first year through development of concrete actions.

The CVRD has provided resources to conduct additional engagement in 2021 to support this process. This process will be advanced through smaller Working Groups with select Roundtable and Steering Committee members to take a "deeper dive" into developing strategies in specific topic areas. Working Groups will be tasked with moving from goal to action, including identifying both longer-term and shorter-term actions. The Working Groups will also consider who would be responsible for implementation, and how the goal can be tracked.

Further, the additional resources will be used for a broader education campaign, which will include an online public engagement through the CVRD Connect website.

A schedule for Year 2 tasks is provided in Figure 4 below.

		2021								2022			
		May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Deliverable 1: Airshed Roundtable, Leadership Group and Working Group													
1.1	Steering Committee meetings												
1.2	Roundtable meetings		24th			23rd		25th				24th	
Deliverable 2: Communications													
2.1	Develop communications strategy (1 per year)												
2.2	Communications - general												
Deliverable 3: Prepare and Implement Regional Airshed Protection Strategy													
3.1	Prepare the Regional Airshed Protection Strategy												
Deliverable 4: Funding													
4.1	Apply for relevant grant opportunities to support the work of the Roundtable					As needed							
Deliverable 5: Reporting & Project Management													
5.1	Project management												
5.2	Prepare year end report												
Deliverable 6: Engagement													
6.1	Develop Connect CVRD content												
6.2	Identify collaborative initiatives												
6.3	Host a public online event						Date TBD						
6.4	Working Groups to develop strategies	25-28	7-11	5-9									

Figure 4: Task schedule for Year 2

Appendix A – Terms of Reference

Comox Valley Regional District
Airshed Roundtable and Steering Committee
Terms of Reference & Guiding Principles

Project Purpose

In 2019, the Comox Valley Regional District (CVRD) Board included air quality as a key project under the Regional Growth Strategy service. At that time, a working group was formed to provide direction and suggestions for a way forward. The Regional Airshed Roundtable is a result of their recommendations.

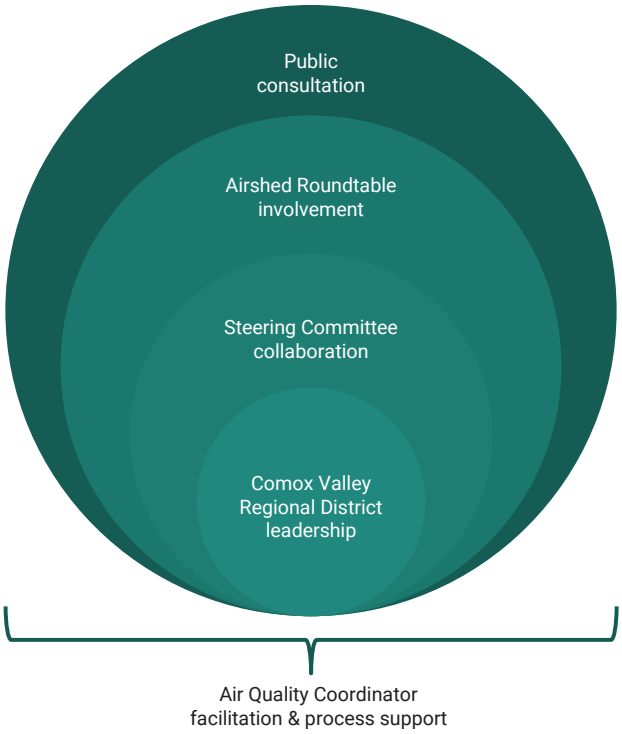
The Regional Airshed Roundtable will support the CVRD to navigate some of the complexities with air quality management in the Comox Valley through collaboration, communication and a strategic approach.

The working group recommendations are outlined in the following report written in 2019: *A Regional Approach to Improve Air Quality and Health in the Comox Valley* (2019 Report). This report outlined the purpose of the Regional Airshed Roundtable to be: ***Working together to ensure the best air possible for a healthy Comox Valley***.

"Working together" acknowledges that no one organization is ultimately responsible for clean air, but rather, that many must work together to achieve the desired outcome. This process is established to enable collaboration to develop and implement a Regional Airshed Protection Strategy. Although the CVRD is leading this process, ultimately all participating organizations will play an important role in implementing the strategy.

Project Governance, Roundtable and Steering Committee Purpose

This work will be led by the CVRD and supported by an Air Quality Coordinator (contracted to Pinna Sustainability). A Steering Committee and Roundtable will also play important roles in this process. The primary responsibilities for each group are:



CVRD:

- To provide funding and resources to establish an Air Quality Roundtable process that will develop and begin implementation of a regional airshed protection plan;
- To make decisions based on input and recommendations put forward through this process;
- To adopt a regional airshed protection plan and implement actions identified for the CVRD to champion.

Air Quality Coordinator:

- To work with CVRD staff to form the Airshed Roundtable;

- To facilitate the process, including Roundtable and Steering Committee meetings;
- To support the preparation and writing of the regional airshed protection plan.

Steering Committee:

- To advance work, including setting priorities and providing direction;
- To identify gaps in knowledge, and support research and engagement to reduce those gaps;
- To support strategic planning including lending expertise;
- To act as champions for air quality management in the Comox Valley.
- Representatives include: local government, health authorities, provincial government and First Nations.

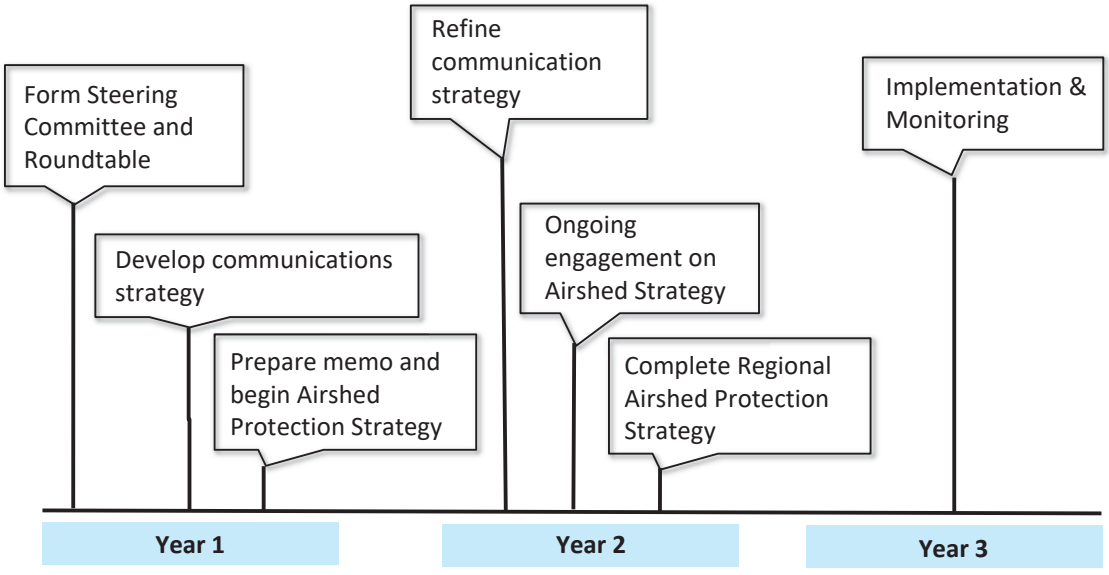
Roundtable:

- To help identify issues and establish shared priorities;
- To offer potential solutions to issues identified;
- To help inform public policy on clean air in the region;
- To share information with the organizations / groups that they represent.
- Representatives include: private industry, non-profit groups, advocacy groups, public sector, schools, health authorities, academics and the general public. The Steering Committee will also participate in the Roundtable.

Broader engagement with the **public** may also be conducted to provide information about the process and increase understanding of the issues, and to obtain feedback on ideas or potential solutions being developed.

Time Commitment and Meeting Schedule

The CVRD has established the Airshed Roundtable as a 3-year process. The Steering Committee will meet 8-12 times per year, and the Roundtable will meet 3-4 times per year. Additional ad-hoc working groups may be formed as required. The first year will include establishing the process and beginning the development of the strategy. The second year will see completion of the strategy and beginning of implementation. The third year will see continued implementation and monitoring of progress.



Participant Responsibilities

This engagement process will follow the Chatham House Rule, whereby the information discussed during the meetings can be used but specific statements cannot be attributed to the individuals who made them or the organization to which they belong. This is to ensure that all participants feel at liberty to freely express opinions and share information without concern that these statements will be publicly attributed to them.

We request that participants in this process:

- Make the commitment of time and resources required to participate in all meetings;
- Participate fully and respectfully in discussions;
- Obtain input from their organizations when required;
- Share relevant and related research where appropriate;
- If not available for a certain meeting, send an alternate from their organization;
- Represent the interests of their organizations or professions to the best of their ability;
- Review any meeting materials prior to each meeting; and
- Adhere to / uphold the guiding principles (see below).

Airshed Roundtable Guiding Principles

The following principles were developed by the working group in 2019 and are included in the 2019 Report, which states: *These principles are a starting place to guide this group to develop effective ways of working together collaboratively, with recognition that this will take practice, commitment, and a clear sense of shared purpose*:

- Be curious, flexible and open to ideas – all views are welcome
- Treat each other with respect
- Work in ways that cultivate trust & shared responsibility
- Take an informed, evidence-based approach
- We are All One Valley, “leave no jurisdiction behind”
    - Find areas of agreement and move forward from there
- Ensure commitment at a leadership level
- Provide clarity (roles, mandate)
- Aim for excellence
- Seek short-term wins with a view for the long game
- Iterate: adapt and continuously improve, while staying focused and on task
- Cultivate a thoughtful, well-chosen membership (get the right people)

We ask all Airshed Roundtable and Steering Committee members uphold these Guiding Principles to support this collaborative process.

Membership

	Organization
Steering Committee	Comox Valley Regional District (2 members)
	City of Courtenay
	Village of Cumberland
	Town of Comox
	BC Wildfire, FLNRORD
	BC Air Quality Section, ENV (2 members)
	Vancouver Island Health Authority
	Vancouver Island University
	K'omoks First Nation (invited)
	Town of Comox (invited)
Roundtable	Chamber of Commerce
	Breathe Clean Air Comox Valley
	Comox Valley Community Health Network
	Comox Valley Nurses for Health & the Environment
	Comox Valley Regional District, Fire Services
	Cumberland Community Forest Society
	Hearth, Patio and Barbeque Association of Canada
	Mid Island Farmers' Institute
	Vancouver Island Health Authority (2 members)
	Alternative energy professionals (2)
	Forest industry
	Woodstove industry
	Public members (6)
Air Quality Coordinator	Pinna Sustainability Inc.

Note that all Steering Committee members are also part of the Roundtable.

Appendix B – Communications Plan

Comox Valley REGIONAL DISTRICT

Engagement Plan

Project Name: **Comox Valley Regional District Airshed Roundtable**	File:

Purpose

- To create a communication plan for the Comox Valley Regional District Airshed Roundtable.

Guiding principles:

- Communications included in all project team meetings and in key project-related discussions
- Project to have budget sufficient to cover communications strategies
- All materials and communication will follow the CVRD style guide

Communication Objectives: 3-5 objectives

- Year 1 August 2020 until March 2021: To share information about the project and State of the Air memo.
    - To increase awareness of health and climate concerns regarding poor air quality
    - The increase awareness of the role of different jurisdictions in air quality management
    - To ensure residents aware of the Airshed Roundtable, purpose and direction
- Year 2 April 2021 – March 2022: Launch the Regional Airshed Protection Strategy Development and obtain input from the public on the Strategy. Share information about high priority action items.
- Year 3 April 2022 – March 2023: To share information about strategies designed during Year 2, and being implemented in Year 3.

Relevant Background

- There is evidence establishing that $PM_{2.5}$ levels in the Comox Valley seasonally exceed provincial and national standards, and that biomass burning (from residential heating and open burning is the predominant source).
- There is also sufficient evidence that the long-term health impacts of $PM_{2.5}$ are significant and of concern, particularly for cardiovascular health, and that residential woodstove use is a main source of concerns for these health impacts in the Comox Valley.
- In 2019, the Comox Valley Regional District (CVRD) Board included air quality as a key project under the Regional Growth Strategy service. At that time, a working group was formed to provide direction and suggestions for a way forward. The Regional Airshed Roundtable is a result of their recommendations.

- The Regional Airshed Roundtable will support the CVRD to navigate some of the complexities with air quality management in the Comox Valley through collaboration, communication and a strategic approach. The Airshed Roundtable will be formed in the fall of 2020 and will work together for a minimum of three years.

Promise to the Public/IAP2 spectrum

- The Regional Airshed Roundtable will involve the public throughout the three years and follow the following spectrum of public participation:
    - Year 1: The Roundtable will **inform** the public on what actions the Roundtable is taking.
    - Year 2: The Roundtable will **consult** the public on the Regional Airshed Protection Strategy and share information about high priority action items.
    - Year 3: The Roundtable will **inform and consult** the public on the implementation approaches designed through the Airshed Protection Strategy.

The following sections(s) are written for Year 1 of the Regional Airshed Roundtable (August 2020- April 2021). A separate communications plan will be created for Year 2 and 3.

Target Audience/ Stakeholders Interests and Tools

- **Target Audience(s):**
    - General Public:
        - In Year 1, the general public will be engaged through the following tools:
            - Website updates and social media posts including information about the activities of the Airshed Roundtable.
            - Print materials (FAQ on the State of the Air)
    - Stakeholders:
        - We will share our program information with the following stakeholders that are able to assist with informing their networks:
            - Municipalities (Town of Comox, City of Courtenay, Village of Cumberland)
            - The Airshed Roundtable (once established)
            - The CVRD Board

Key Messages – (3-5 key messages for media or target audience)

1. The Airshed Roundtable is here to help guide planning for better air quality in the region for the next three years.

2. The CVRD is committed to providing a healthy, safe community for all residents. Learn more about air quality and Airshed Roundtable at www.comoxvalleyrd.ca/airshedroundtable
3. The Airshed Roundtable is made up members from our community and will develop an Airshed Protection Strategy for our region.

ADDITIONAL DOCUMENTS

- The Comox Valley State of the Air Memo (forthcoming, fall 2020) provides the Airshed Roundtable with an overview of the current state of the air in the Comox Valley Regional District, including highlighting air quality data, studies and work completed to date in the Comox Valley, key policy context and next steps for the Roundtable.

Engagement Approach

- In Year 1 of the Airshed Roundtable, the communications approach will be primarily informing the public about purpose, goals and next steps of the Roundtable. Internally, the focus will be on ensuring that all members of the Roundtable (both those that sit on the steering committee and those that sit on the Roundtable) are working from a common place of knowledge by producing the State of the Air Memo.

Opportunities and Risks:

Risks may include:

- Stakeholder meetings will be held virtually, at least within the first six months of the project, due to the COVID-19 pandemic. This may limit or restrict participant involvement (see also opportunity).
- Diverse opinions or residents feeling they are not being heard could create tension within community and within roundtable.
- Homeowners who are not involved in the roundtable may object to the actions proposed.

Opportunities that arise may include:

- Residents and stakeholders of the Comox Valley Regional District may be more aware of respiratory health and wellness due to the COVID-19 pandemic. There is an opportunity to acknowledge the potential connection between air quality and the pandemic within the State of the Air memo, though, it won't be the focus.
- The virtual nature of engagement that will be necessary due to the COVID-19 pandemic may mean that stakeholders are more likely to participate in Roundtable meetings and engagement (i.e. they don't have to travel to a central site).

- Having a roundtable made up of diverse stakeholders and interest groups will provide a strategy that will hopefully be adopted and respected by all parties.

Key Topics for Engagement:

- The launch of the Airshed Roundtable.
- The findings from the State of the Air memo.

Timeline:

- July / August: Formation and invitations to the Airshed Roundtable
- September: Airshed Roundtable meets for the first time
- October/November2020: State of the Air Memo complete
- October 2020 to April 2021: Website/social media updates and print materials (State of the Air memo)

Tools and Techniques:

Tool/Task	Description	Responsible Party	IAP2 Spectrum	Budget	Date
Staff CVRD Connect Newsletter	• Summary about the launch of the Airshed Roundtable	• Creation: Policy and Planning Analyst • Approval: Alana/Jennifer	INFORM	Staff time	August 5, 2020 (for September issue)
Press Release	• Highlight the launch of the Roundtable and share the project webpage & organizations on the roundtable	• Creation: Policy and Planning Analyst • Approval: Alana/Jennifer • Implementation: Jennifer	INFORM	Staff time	Late September (after first Roundtable meeting)
State of the Air Memo	• Write the State of the Air Memo for an internal audience, but will also be posted on the CVRD website. • Provide final copy of memo to all members of the Airshed Roundtable.	• Creation: Pinna Sustainability with support from CVRD • Distribution to Roundtable: Pinna • Update to CVRD project webpage: Policy and Planning Analyst/Beverly	INFORM	Staff/consultant time	October/November 2020

Comox Valley REGIONAL DISTRICT

Engagement Plan

Tool/Task	Description	Responsible Party	IAP2 Spectrum	Budget	Date
FAQ – State of the Air Memo	• Develop a 1-page FAQ to highlight key findings from State of the Air Memo targeted at the general public • Provide final copy of memo to all members of the Airshed Roundtable. • Upload PDF to CVRD website and share in social media post.	• Creation: Pinna Sustainability with support from CVRD • Update to CVRD project webpage/social media post: Policy and Planning Analyst/Beverly	INFORM	Staff/consultant time	November 2020
Social media content	• Provide one social media post (content and image) to highlight the launch of the Roundtable & provide updates on action taken in Year 1 (intend to do a post after each Roundtable meeting – 3 to 4 per year)	• Creation: Pinna Sustainability with support from CVRD • Approval: Policy and Planning Analyst/Jennifer • Schedule FB post: Beverly	INFORM	Staff/consultant time, potentially some extra $ to boost posts, if deemed necessary (TBD)	September 2020 – April 2021
CVRD Website updates	• Updates to the Airshed Roundtable Project Page • Highlight launch of the Airshed Roundtable & provide updates on actions taken in Year 1 • Updates will mirror the same timeline as social media posts and will inform the public of the roundtable meetings.	• Creation: Pinna Sustainability with support from CVRD • Website updates: Policy and Planning Analyst/Beverly • Approval: Jennifer	INFORM	Staff/consultant time	September 2020 – April 2021
Updates to the Board	• After each Roundtable meeting either a staff report (if there are decisions to be made) or briefing note to be prepared for the Board	• Creation: Planning and Policy Analyst • Approval: Alana, Scott, Russell (for SR) • Approval: Alana/Jennifer (briefing note)	INFORM	Staff time	September 2020 – April 2021

Comox Valley REGIONAL DISTRICT

Engagement Plan

Budget

The 2020 budget is staff and consultant time. Potential to boost Facebook posts to reach a broader audience (TBD).

Closing the Loop

- Year 1 of a multi-year project, communications will be ongoing.

Spokesperson

- Policy and Planning Analyst, Planning and Development Services Branch
- Cariad Garratt, Air Quality Coordinator, Pinna Sustainability, Regional Airshed Roundtable

Approval History

Created by:	Pinna Sustainability and Brianne Labute, July 21, 2020
Amended:	
Approved:	July 22, 2020

Appendix C – State of Air Memo

May 7, 2021

Regional Airshed Roundtable State of the Air Memo

Comox Valley Regional District

September 2020

Submitted to: **Regional Airshed Roundtable**, Comox Valley Regional District
Submitted by: Pinna Sustainability Inc.

Table of Contents

Cover photo: Illustration of smoke trapped in the Comox Valley, source: Comox Valley Regional District

1. Context

Background

Since 2008, there has been an increasing body of evidence demonstrating that air quality in the Comox Valley is concerning due to high levels of fine particulate matter, especially during the fall and winter seasons when levels of this pollutant exceed national standards. Fine particulate matter is a pollutant that contains microscopic particles that can be inhaled and cause serious health problems affecting your lungs and your heart. There is no known safe level of fine particulate matter.

Recognizing the importance of this issue, local efforts have been implemented to reduce levels of fine particulate matter, including the Comox Valley Regional District's (CVRD) Wood Smoke Reduction Program, local government bylaw updates, and education and outreach initiatives by both the CVRD and the local advocacy groups. Despite these efforts, local air monitoring results show no significant improvement in fine particulate matter levels.

In 2019, the CVRD Board included air quality as a key project under the Regional Growth Strategy service and formed a working group with representation from four local governments, Island Health, the BC Ministry of the Environment and the Comox Valley Community Foundation. This working group recommended that a Regional Airshed Roundtable be formed – a collaborative group of representatives from government, industry and community – to identify, evaluate and recommend opportunities for reducing air pollution in the Comox Valley. In 2020, the CVRD Board resolved to create a Regional Airshed Roundtable and supporting Steering Committee tasked with developing and supporting implementation of a Regional Airshed Protection Strategy (see Appendix A for a list of participants and description of these two groups).

Purpose of this memo

This State of the Air memo provides the background to prepare the Airshed Roundtable for participation in a three-year process to develop and implement a Regional Airshed Protection Strategy. This memo summarizes the current state of the air in the Comox Valley (air quality data, pollutant sources, studies and work completed to date), highlights how air pollutant sources are regulated and managed, and provides examples of what an airshed protection strategy may include. It provides members of the Roundtable a common understanding of this information in preparation for collaboratively developing an airshed protection strategy for Comox Valley. Key messages from this memo and the Roundtable discussions will be communicated with the public during the process.

Impacts of air pollution

Air pollution can come from many different sources and can result in a wide spectrum of impacts, including affecting local air quality and human health, contributing to acid rain, depleting the ozone layer and contributing to global climate change. Air pollution may concentrate in specific areas such as valleys, or may travel a great distance, depending on wind patterns and geography. When pollutants concentrate in an area, local air quality is impacted and this can cause serious impacts on human health. The World Health Organization estimates that one third of deaths from stroke, lung cancer and heart disease are due to air pollution worldwide.[1] The International Agency for Research on Cancer classified outdoor air

[1] https://www.who.int/airpollution/news-and-events/how-air-pollution-is-destroying-our-health

pollution as a carcinogen in 2013[2], while emergent studies have been linking air pollution with declining cognitive ability in older adults, as well as birth defects.[3] In Canada, Health Canada estimates that 14,600 premature deaths per year can be attributed to air pollution from fine particulate matter, nitrogen dioxide and ozone.[4]

Everyone is affected by air pollution; however, it has a disproportionate impact on some people. Air pollution can have more impact on older adults, younger children, those who are active outdoors, and those with existing heart, breathing or lung conditions. Further, because air pollution can concentrate in specific areas, people that live closer to industries, busy roadways or other concentrated sources of pollution (such as residential wood stoves) are more impacted.

Climate change is also linked to air quality in two ways. In most cases, when greenhouse gas emissions are released into the atmosphere from sources such as vehicles, industry and agriculture, other harmful pollutants are released at the same time. Second, some impacts resulting from climate change can result in increased air pollution, such as extreme heat and more frequent and intense wildfires.[5]

Air pollution may also impact visual air quality, as well as produce nuisance odours, making a region less attractive to residents and tourists.

Complexity of addressing air quality

Although the impacts of air pollution are well documented and significant, it is not simple to manage air emissions for many reasons. Improving air quality involves a blend of changing personal choices, cultural values and government regulations – including many different departments and levels of government. As this memo will outline, major sources of air pollutants include using wood stoves to provide heat in homes, open burning to manage debris and reduce fire risk, vehicles and equipment that serve our daily needs, and more. Addressing this variety of sources requires collaboration across many organizations and community members.

Wood stoves, for example, provide an affordable source of heat for many residents in the region and it may cause financial strain to shift to other heating units. A survey conducted by the CVRD found that while 38% of respondents use wood stoves, 75% of those wood stove users would like to change their heating source. The majority of those wishing to change would like to install a heat pump if they could afford it.[6]

The Airshed Roundtable will be tasked with learning about the complexities of these sources of emissions, considering the options for managing them, and developing recommendations for many different organizations to implement in order to achieve the goal of improving air quality in the Comox Valley.

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[2] https://www.iarc.fr/news-events/iarc-outdoor-air-pollution-a-leading-environmental-cause-of-cancer-deaths/

[3] Ailshire, J. A., & Clarke, P. (2015). Fine particulate matter air pollution and cognitive function among U.S. older adults. *Journals of Gerontology - Series B Psychological Sciences and Social Sciences*, *70*(2), 322–328. https://doi.org/10.1093/geronb/gbu064

Yuan, L., Zhang, Y., Gao, Y., & Tian, Y. (2019). Maternal fine particulate matter (PM 2.5) exposure and adverse birth outcomes: an updated systematic review based on cohort studies. *Environmental Science and Pollution Research*, *26*(14), 13963–13983. https://doi.org/10.1007/s11356-019-04644-x

[4] http://publications.gc.ca/site/eng/9.874080/publication.html

[5] https://climateatlas.ca/climate-change-air-quality-and-public-health

[6] Comox Valley Home Heating and Air Quality Survey Report

2. Air pollutants and sources in Comox Valley

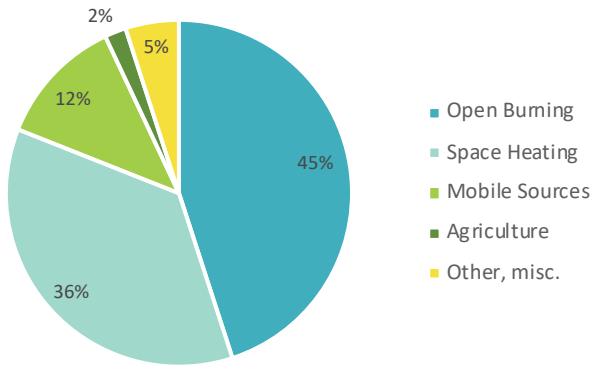
The primary pollutants that impact human health include: fine particulate matter, nitrogen dioxide and ground-level ozone. Although the primary focus of the Regional Airshed Roundtable will be placed on fine particulate matter, as it is currently the only air pollutant to exceed standards in the Comox Valley, it will also be important to consider other air pollutants that affect air quality and opportunities to reduce impacts of these.

Fine particulate matter

What is $PM_{2.5}$?
Particulate matter that is 2.5 microns wide or smaller is called fine particulate matter, or $PM_{2.5}$. Fine particulate matter is directly emitted from combustion (e.g. forest fires, woodstoves, vehicle engines), and can also form when other pollutants in the air undergo chemical reactions under certain conditions (e.g. ammonia, nitrogen oxides, sulphur oxides). These fine particulates can be inhaled deep into your lungs, passing into and traveling through your bloodstream to all parts of your body. Exposure to fine particulate matter can lead to asthma attacks, chronic bronchitis and heart attacks. It is most dangerous to children with asthma, older adults, and people with an underlying breathing and/or heart condition.

In 2017, the Ministry of Environment and the CVRD retained RWDI to complete an air emissions inventory of particulate matter in the Comox Valley (including City of Courtenay, Town of Comox, Village of Cumberland, CVRD Electoral Areas A, B, C and the First Nations within these geographical areas).[7] Emissions inventory data estimates major sources; however, it is bounded by limitations, including time base and estimation methods. The inventory shows that the primary sources of $PM_{2.5}$ in the Comox Valley are open burning and space heating (see **Error! Reference source not found.**). More detailed sources are listed to the right of the figure, with the four most significant sources underlined. These are important to be aware of when considering how to manage emissions because they are often regulated by different agencies.

Figure 1. Sources of PM2.5 in the Comox Valley in 2015



Open burning: provincially-regulated pile and area burns (42%), municipally-regulated backyard burns and pile burns (4%), recreational and wildfires (<1%)
Space heating: wood burning in homes (35%), natural gas, propane and heating oil (<1%)
Mobile: non-road equipment (5%), marine vessels (3%), light-duty vehicles (2%), heavy-duty vehicles (2%), aircraft (<1%)
Agriculture: tilling (1%), wind erosion (1%), crop burning, livestock and other (<1%)
Other, misc: meat cooking (3%), landfills (1%), construction (1%), cigarettes, industry and structural fires (<1%)

There are other open-burning sources that may have not been captured by the emissions inventory study (unregulated backyard and pile burns, as an example). While their total contribution may be relatively small, their air quality impact may still be significant due to proximity to residential areas. The

[7] https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/comox_valley_pm_emissions_inventory.pdf

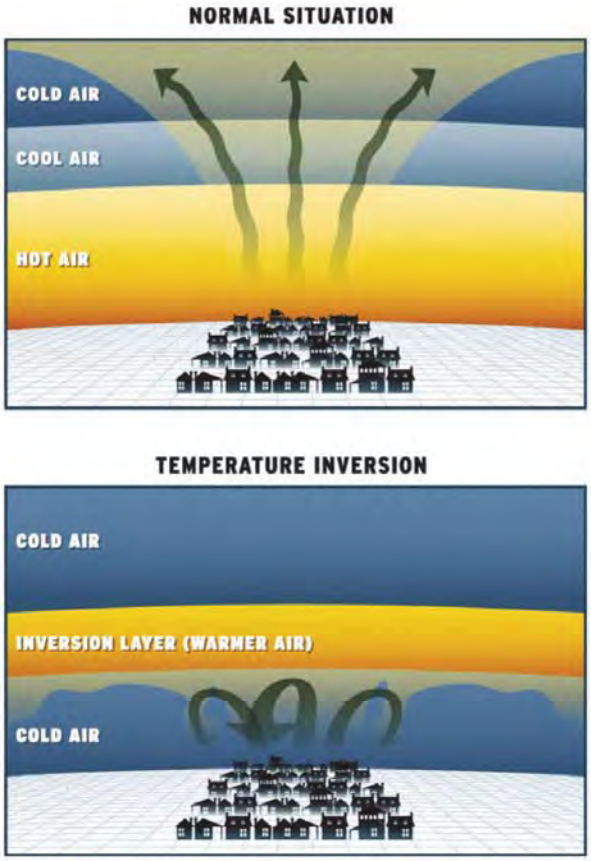
amount of $PM_{2.5}$ that is emitted from open burning and space heating depends on the **burning practices** used. Fires that burn hot release less $PM_{2.5}$, but burning wet, dirty or unseasoned wood result in more smoke and higher $PM_{2.5}$ emissions. For woodstoves, **using an old uncertified woodstove** will also result in much higher $PM_{2.5}$ emissions than a newer stove that is certified by US EPA or CSA standards.

Although the emission inventory provides an important overview of the sources of $PM_{2.5}$ in Comox Valley, it does not provide the whole picture when it comes to the potential impact on air quality and people's health. It is also important to understand that the contribution from each of the sources can vary by day, week, season, and by location. For instance, data analysis shows that **$PM_{2.5}$ concentrations are generally higher in fall and winter months in the Comox Valley**, with rising levels in mid-afternoon and peaking in the evenings (a signature of wood stove smoke).

In addition to the influence of seasonal weather, proximity of people to emission sources can lead to increases in exposure and impacts. For example, large forestry burn piles are strongly regulated and are typically well removed from population centres, whereas backyard burning may occur in residential areas potentially have a greater impact. Wood stove emissions occur right where people live, work and play.

The valley location makes the area susceptible to frequent temperature inversions, especially during colder months, and this means that air gets trapped for a longer period of time during these episodes.[8] If air is trapped in an inversion at the same time as there is an increase in emissions from sources –e.g. wood stoves or open burning during the colder months – then the emissions may build up to unacceptable levels (see Figure 2 for an illustration of this effect).

Figure 2. Illustration of woodsmoke accumulated within a valley (source: Environment Canada)



Other air pollutants

Other pollutants are important to monitor and manage, as they are also linked to adverse health outcomes. Table 1 lists other key air pollutants, their typical sources and their impacts. Because the emissions inventory conducted for the Comox Valley was limited to particulate matter, the source of other pollutants is general to all of British Columbia and not specific to the Comox Valley. Because Comox Valley does not have heavy industrial activity, the majority of the pollutant sources in Comox Valley are likely from mobile sources (cars, trucks and off-road equipment) and area sources (open burning, residential burning, solvents and others).

[8] Patterns of Air Quality and Meteorology in Courtenay B.C. 2011-2016, BC Ministry of Environment, 2017

Table 1. Summary of other air pollutant sources and impacts

Pollutant	Sources[9]	Air quality impacts[10]
Nitrogen oxides (NO_x)	Primarily **mobile** sources (trucks, cars, off-road equipment and marine vessels), remaining from industrial point sources	• Affects respiratory systems • Damages vegetation • Major contributor to secondary $PM_{2.5}$ and ozone formation
Volatile organic compounds (VOCs)	Roughly evenly from **mobile** sources (trucks, cars, off-road equipment), industrial point sources and **area** sources (fossil fuel evaporation, general solvent use, natural sources like coniferous forests and vegetation)[11]	• Major contributor to ozone and secondary $PM_{2.5}$ formation • Individual VOCs are known or suspected of direct toxic effects on humans
Ozone (O_3)	Forms when **NO_2 and VOCs combine** in sunlight on warm days	• Linked to pre-mature mortality • Aggravates existing conditions like asthma • Main component in smog • Injures crops and vegetation, reducing yields and may contribute to forest decline
Sulphur oxides (SO_x)	Primarily industry (upstream oil and gas and pulp and paper), and remaining from **mobile** sources (mostly marine vessels)	• Adverse effects on respiratory systems • Damages vegetation and causes acid rain • Contributor to secondary $PM_{2.5}$ formation
Carbon monoxide	Over half from **mobile** sources (trucks, cars and off-road equipment), and remaining from industrial point sources (wood industry) and **area** sources (mostly prescribed open burning and wood stoves)	• Affects blood capacity to carry oxygen to organs and tissues

3. Air quality in Comox Valley

Since 2008, experts have been studying air quality in the Comox Valley, including monitoring air quality, and publishing studies about the relationships between pollution sources and health impacts in the area.

What is an airshed?

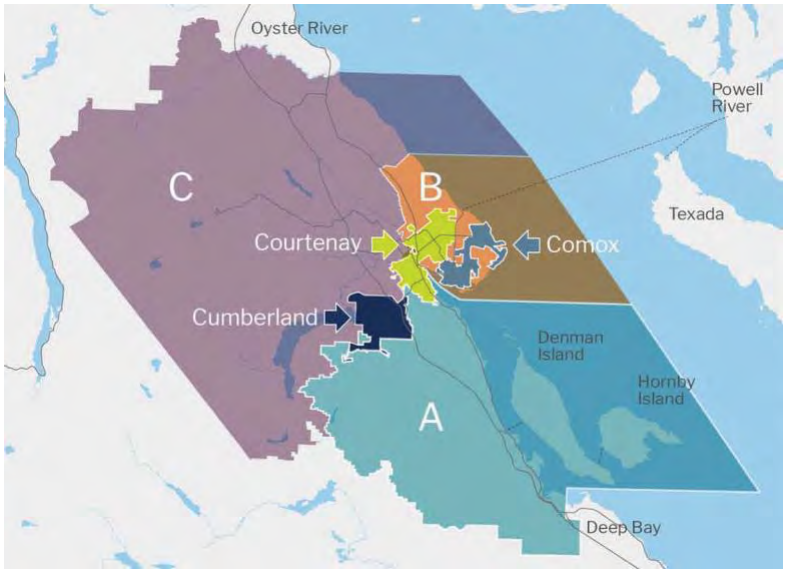
The term "airshed" is used to describe an area where the movement of air, and air pollutants, is hindered by local geographic features and weather conditions. Airsheds can vary in size depending on the current conditions, but for this strategy, we will consider the airshed to be inclusive of the Comox Valley. The Comox Valley is vulnerable to the frequent formation of temperature inversions, particularly during the winter months, which can decrease the ability of the atmosphere to disperse pollutants.

[9] 2000 British Columbia Emissions Inventory of Criteria Air Contaminants: Result Highlights, BC Ministry of Water, Land and Air Protection, 2005

[10] https://www.canada.ca/en/environment-climate-change/services/air-pollution/pollutants/common-contaminants.html and http://airquality-qualitedelair.ccme.ca/en/

[11] Cannabis production, an emerging industry, may also be a source of VOCs in some areas, as noted in the 2020 State of the Air report released by the BC Lung Association. Cannabis production was not identified as a source in the provincial emission inventory completed in 2000.

Figure 3. Map of the Comox Valley Regional District (source: CVRD)



Monitoring

Air pollutants measured in the Comox Valley include particulate matter, nitrogen oxides and ozone. Measurements have been collected through a combination of stationary and mobile monitoring stations:

- **Stationary monitoring:** One permanent monitoring station is located in Courtenay, at the Courtenay Elementary School. Air quality parameters currently measured here include $PM_{2.5}$, nitrogen dioxide and ozone. This is run by the provincial Ministry of Environment and has been in place since July 2011.
- **Mobile monitoring:** Instruments have been deployed for a short period of time, at temporary locations, in relation to academic studies looking at $PM_{2.5}$. Mobile monitoring has provided an opportunity to gather samples from various geographical points and pockets in the region.

Both types of monitoring are important – the permanent stationary monitor provides an ongoing long-term data set to monitor conditions in the region broadly; while the mobile monitoring provided insight into conditions that may appear in specific "hot spots" by being close to pollution sources and/or due to weather and geography conditions trapping the pollutants.

What is the Air Quality Health Index?

The Air Quality Health Index (AQHI) is a scale developed in Canada to indicate the potential impact of current air quality conditions on health. It is a tool to inform the public about how to alter activity levels based on the current air quality conditions. For this region, the AQHI is monitored and published by the BC Ministry of Environment and is based on hourly air quality readings from the monitoring station in Courtenay.[12]

Air quality standards and objectives

Air quality standards establish limits on air pollutants based on monitored air quality data and are intended to drive action to protect human health and the environment. The aim is to keep air pollutant

[12] AQHI for the Comox Valley found here: http://www.env.gov.bc.ca/epd/bcairquality/data/aqhi.html?id=AQHI-Comox_valley

levels far below all standards, however, when pollutants near or surpass standards then governments act to reduce those pollutant levels.

BC has adopted the Canadian Ambient Air Quality Standards (CAAQS) and provincial Air Quality Objectives (AQO) for $PM_{2.5}$, ozone, SO_2 and NO_2. They are generally expressed as a concentration averaged over a specific period of time. There are two sets of standards and objectives for $PM_{2.5}$ – one is averaged over 24 hours and one is averaged over one year (see Table 2 for the national and provincial levels.) [13]

Table 2. Federal CAAQS and Provincial AQOs for $PM_{2.5}$

Averaging period	Federal CAAQS (µg/m³)	BC AQO (µg/m³)
24-hour	27	25
Annual	8.8	8

The 24-hour AQO serves as a reference for issuing air quality advisories. An advisory is typically issued whenever the $PM_{2.5}$ running mean exceeds the 24-hour AQO and the exceedance is expected to remain for an extended period of time. The air quality advisory that is issued will state that at-risk populations should reduce or reschedule strenuous activities outdoors, and that the general public should consider reducing or rescheduling strenuous activities outdoors.

Summary of air quality monitoring data in the Comox Valley

Table 3 and Figures 4 to 6 provide a summary of the air quality $PM_{2.5}$ objectives for Comox Valley, based on the air quality data monitored at the Courtenay Elementary School monitoring station. This data demonstrates that $PM_{2.5}$ has exceeded the provincial objective annually between 6 and 26 days in recent years. Other pollutants are well below the provincial objectives and national standards.

Table 3. $PM_{2.5}$ measurements for provincial AQOs at Courtenay Elementary station, 2012-2019[14]

	Annual mean - wildfires removed (µg/m³)	Annual mean - effect of wildfires (µg/m³)	24-hour 98th percentile - wildfires removed (µg/m³)	24-hour 98th percentile - wildfires effect (µg/m³)	Max daily values - wildfires removed (µg/m³)	# days exceeding provincial objective - wildfires removed	# days exceeding provincial objective - effect of wildfires
2012	9.2	0	29.7	0	39.2	12	0
2013	11.4	0	33.4	0	42.8	26	0
2014	9.2	0	30.8	0	42.6	19	0
2015	8.2	0.2	32.3	4.3	50.6	14	3
2016	7.7	0	31.8	0	36.1	17	0
2017	9	1.2	30.9	3.3	36.1	25	9
2018	8	1.4	25.2	1.8	32.2	8	7
2019	7.7	0	24.4	0	30	6	0

Table note: *Cells highlighted in yellow show where the measurements exceed the provincial objectives.*

[13] For detailed listing of national standards and provincial objectives, and how they are calculated, see: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/prov_aqo_fact_sheet.pdf

[14] Patterns of Air Quality and Meteorology in Courtenay B.C. 2011-2016, BC Ministry of Environment, 2017 and Personal Communication with Tarek Ayache, Ministry of Environment and Climate Change Strategy, August 2020

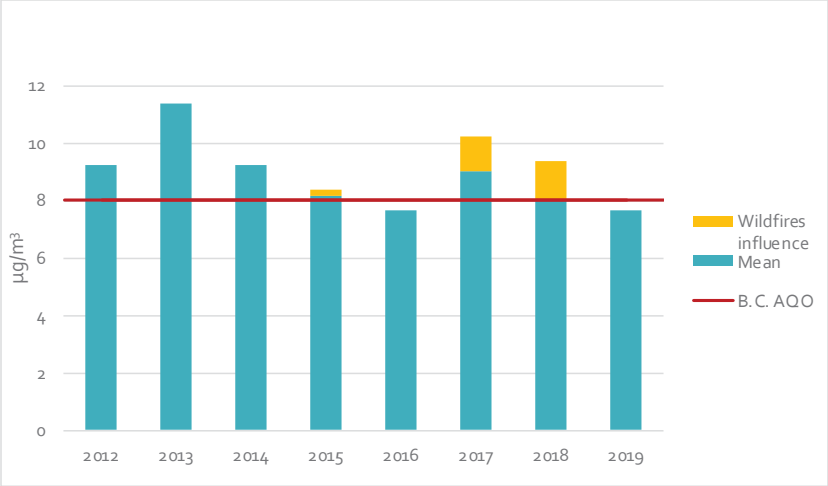


Figure 4. Courtenay Elementary - $PM_{2.5}$ annual provincial AQO

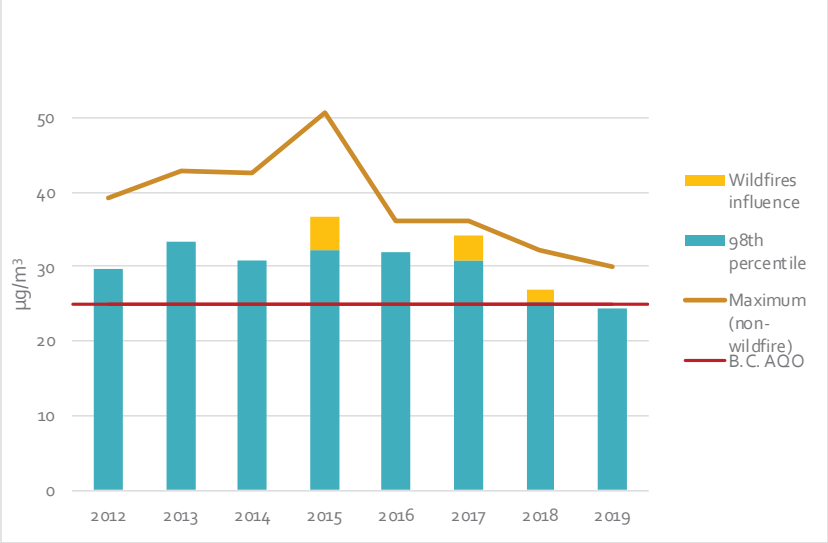


Figure 5. Courtenay Elementary - $PM_{2.5}$ 24-hour provincial AQO

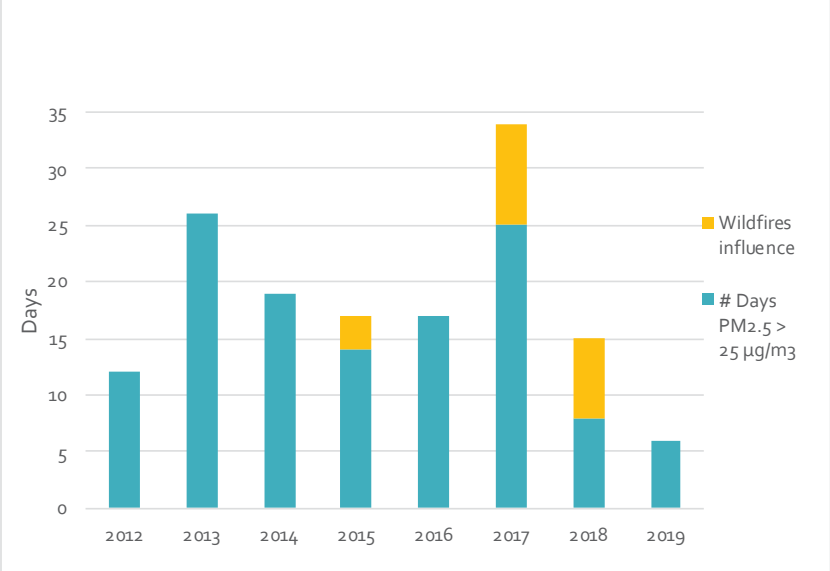


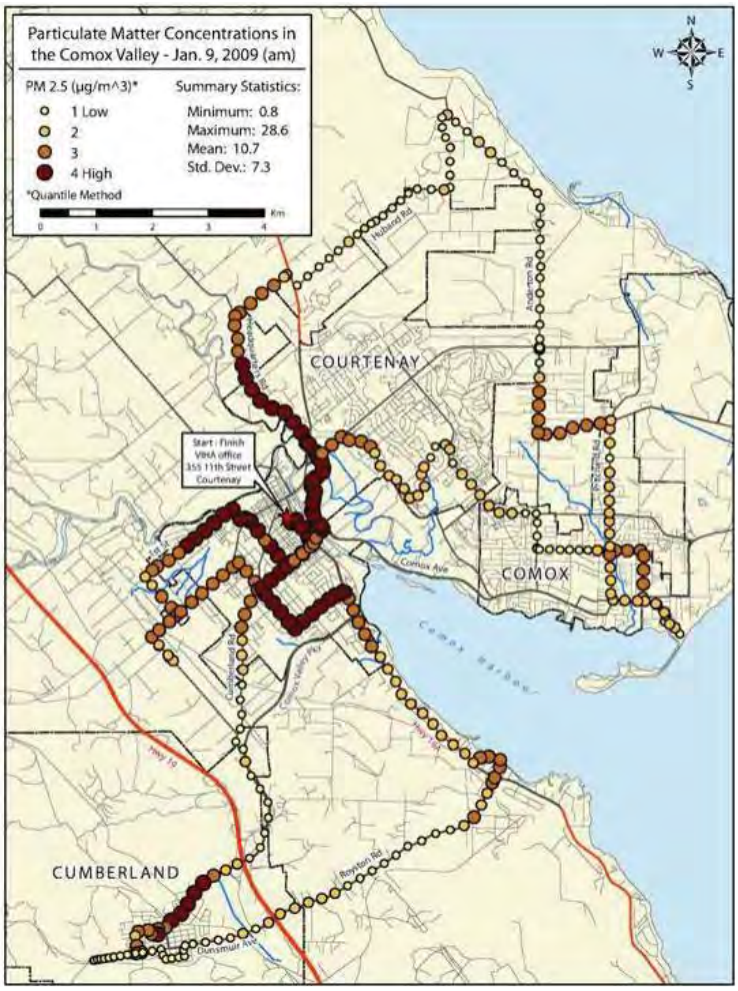
Figure 6. Courtenay Elementary – number of daily exceedances of the provincial AQO for $PM_{2.5}$

Key findings from studies in the Comox Valley

In addition to the air quality monitoring, AQHI and the emissions inventory discussed above, several studies have been conducted in the Comox Valley to better understand $PM_{2.5}$ pollution and its impacts. These include:

- The earliest study of air quality in the Comox Valley occurred in **2008-2009,** facilitated by a group of stakeholders (residents, local government, Ministry of Environment and University of Victoria) measured elevated levels of $PM_{2.5}$ across large parts of the Comox Valley. The research found hotspots of $PM_{2.5}$ in Cumberland, western portions of Comox, and the commercial/residential areas of Courtenay (see Figure). These hotspots suggested residential wood heating emissions, and could have been affected by local traffic emissions as well. Due to limitations of mobile monitoring, the study recommended further research including long-term monitoring at a fixed site.
- In **2017**, researchers aimed to understand more about the cardiovascular health impacts of $PM_{2.5}$ from burning biomass in three regions in Canada – one being the Comox Valley. The study found that short-term changes in ambient $PM_{2.5}$ were associated with an increased risk of myocardial infarction (heart attack) among elderly subjects. The strongest association was found during colder periods (when residential wood stoves are used the most).[15]
- In **2018**, a University of British Columbia graduate student, Matthew Wagstaff, completed a thesis which measured the variation of $PM_{2.5}$ from residential wood smoke using fixed and mobile monitoring during the winter of 2017. The monitoring instruments were able to distinguish wood smoke from other sources of $PM_{2.5}$. The results clearly showed times and areas where residential wood stoves were the primary source of $PM_{2.5}$, and they also showed hotspot areas with consistently higher concentrations of $PM_{2.5}$ and wood smoke.[16]

Figure 7. $PM_{2.5}$ concentrations in the Comox Valley on January 9, 2009



[15] *Biomass Burning as a Source of Ambient Fine Particulate Air Pollution and Acute Myocardial Infarction*, Weichenthal, et al, Epidemiology Volume 28, Number 3, May 2017

[16] *Monitoring Residential Woodsmoke in British Columbia Communities*, Matthew Wagstaff, Thesis submitted for Master of Science at the University of British Columbia, 2018

Studies from outside of the Comox Valley

In addition to the work conducted to understand air quality in the Comox Valley, experts around the world are conducting studies that link air pollution to health impacts and climate change. The World Health Organization and BC Lung websites are excellent resources to find current information.[17] Some recent studies highlight additional factors that may be relevant to consider when preparing an airshed protection strategy for Comox Valley, including:

- In the USA, researchers are investigating the impacts of long-term exposure to $PM_{2.5}$ and increased risk of COVID-19 deaths. The study found that a small increase in long-term exposure to $PM_{2.5}$ leads to a large increase in COVID-19 death rate.[18]
- A recent literature review aimed at understanding the health impacts of wildfire smoke exposure found that wildfire smoke exposure is associated with respiratory morbidity, and that more study is needed to clarify the link with mortality and cardiovascular outcomes.[19]
- In Ontario, a recent modelling study revealed that shifting to electric vehicles and cleaner, newer trucks could save hundreds of lives every year due to cleaner air quality, while also cutting almost 70% of the Greater Toronto and Hamilton Area greenhouse gas emissions from traffic, leading to billions of dollars in social benefits.[20]

4. Air quality management in Comox Valley

In British Columbia, air quality is managed through a range of federal and provincial acts and regulations (laws), local bylaws and programs, and the type of management varies by pollution source. When legislation is developed, it happens through a consultation process with public, business and industry, nongovernmental organizations and other interested parties – demonstrating that air quality management can be complex and involve many levels of government and organizations.

Regulations addressing air quality

- **Federal government**: The *Canadian Environmental Protection Act* (CEPA) regulates motor vehicle standards and fuels, off-road and rail engines and marine engines.
- **Provincial government / Canadian Council of Ministers of the Environment (CCME)**: BC is a member of CCME which has set Canadian Ambient Air Quality Standards for $PM_{2.5}$, ozone, nitrogen dioxide and sulphur dioxide.
- **Provincial government**: BC controls pollution from point and area sources and can require the preparation of air quality management plans through various regulations, including the following of particular relevance to the Comox Valley:
    - *Environmental Management Act (EMA)*: regulates industrial and municipal waste discharge, pollution, and hazardous waste. The EMA is the larger legislation within which the following regulations fall under.
    - *Open Burning Smoke Control Regulation*: regulates land clearing, forestry operations and agriculture, giving the conditions when and where open burning is allowed.

[17] https://www.who.int/health-topics/air-pollution and https://bc.lung.ca/protect-your-lungs/air-quality-lung-health/bc-state-air-report
[18] https://www.medrxiv.org/content/10.1101/2020.04.05.20054502v2
[19] http://dx.doi.org/10.1289/ehp.1409277
[20] https://clearingtheair.ca/wp-content/uploads/2020/06/Clearing-The-Air-OPHA-EDC-Final.pdf

  - *Solid Fuel Burning Domestic Appliance Regulation*: requires wood stoves sold in BC to meet certified emission standards, and regulates that only untreated seasoned wood or wood products can be burned.
  - *Climate Change Legislation*: numerous regulations aiming to significantly reduce greenhouse gas emissions; in many cases these will have positive impacts on air quality.
  - *Wildfire Act and Regulation*: specifies rules and regulations around fire use, fire prevention and wildfire control.
- **Local governments (regional and municipal)**: Local bylaws can be adopted to control emissions for open burning in residential yards, wood stoves and vehicle idling. Local governments can also address air pollution through land use and transportation planning, regional growth strategies, sustainability plans, and local education and incentive programs.

Local government actions addressing air quality

Table 4 highlights local government actions taken to address air quality in the Comox Valley, including regulating open burning and installation of new wood stoves, as well as providing programs that reduce the sources of emissions. Open burning is banned within municipal boundaries, however in certain unincorporated areas open burning is regulated and requires a permit. For example, CVRD bylaw #258 imposes restrictions on open burning and covers select areas outside of the Village of Cumberland. In the CVRD there are many fire service areas - 8 rural, 4 improvement district and 3 municipal – all of these have different bylaws and regulations. This multitude of fire service areas creates challenges for regulating open burning on a regional level.

The **Wood Smoke Reduction Program** is offered through funding from the provincial Wood Stove Exchange Program. In 2020, rebates are being offered for removing a 5+ year old wood-burning appliance and replacing it with a high efficiency gas, pellet or propane stove / insert, or an electric heat pump. Enhanced rebates for electric heat pumps are provided by Island Health for specific areas with higher concentrations of wood smoke.

Table 4. Local government actions in Comox Valley to address air quality

Action	Comox Valley Regional District	City of Courtenay	Town of Comox	Village of Cumberland
Bylaw prohibiting open burning	x^	x	x	x
Bylaw banning installation of new wood stoves*		x	x	x
Wood Smoke Reduction Program**	x	x	x	x
Comox Valley Waste Management Centre composting program	x (drop-off only)	x (drop-off only)	x (collection)	x (collection)
Notes: ^ Applies to rural Cumberland only * In Cumberland, new wood stoves are banned in new construction only; in Courtenay and Comox, all new wood stoves are banned. ** Funding for this program is provided by BC Ministry of Environment, BC Lung Association and Island Health and Island Health				

Actions with potential co-benefits for air quality in the Comox Valley

In addition to the efforts outlined above that directly relate to air emissions in the Comox Valley, several strategies and projects are being implemented by the Comox Valley Regional District that may have co-benefits to air quality, including:

- CVRD, Active Transportation Plan and Gap Analysis on multi-modal transportation in the region (work still to begin): improved access to other modes of transportation can have co-benefits for air quality
- CVRD, Residential Retrofit Acceleration Strategy (in progress): recommended priority retrofit actions in this strategy could impact air quality
- CVRD, Poverty Reduction Strategy (project has been funded and is in the scoping phase): strategy could consider the affordability of alternative home heating options to wood stoves

5. Next Steps

The Regional Airshed Roundtable will work together to develop and implement a Regional Airshed Protection Strategy (airshed strategy). The airshed strategy will be compiled through a collaborative approach, working with organizations and individuals who have been invited to sit on the Airshed Roundtable and Steering Committee (Appendix A). Using baseline information gathered in this state of the air memo and elsewhere, the airshed strategy will be a collection of research, analysis and discussions that lead to the identification of recommended actions that can support the reduction of air pollution within the Comox Valley. Many different organizations will ultimately need to implement actions identified, and so the Airshed Roundtable and Steering Committee will be tasked with advocating for and assisting with implementation of the strategy once developed.

Examples from other airshed strategies in BC

Several types of actions can emerge from an airshed strategy, and a few examples pulled from similar strategies developed by other regions include (note these are not comprehensive lists from any of these plans, just a subset of the full actions each is undertaking):

- Cowichan Valley:
  - Raise public awareness of health impacts of wood smoke
  - Develop consistent bylaws for open burning and for wood stoves across the region
  - Explore options for curbside pickup of yard and garden material
  - Promote use of alternative heating systems
- Alberni Valley:
  - Annual woodstove exchange program offers incentives to remove old stoves
  - Education about air quality action areas, focusing on reducing emissions from outdoor burning, wood heating and vehicles (see Appendix B for an infographic summary)
- Prince George:
  - Support the development of new research projects in the airshed that enhance understanding of particulate matter and odour emissions sources
  - Provide a forum for inter-agency communication and collaboration to address air quality
  - Communicate air quality needs and potential solutions to key agencies and individuals in the community, who may or may not be members of the Roundtable
- Central Okanagan:
  - Integrate air quality requirements and targets into transportation and land use plans

- Minimize pollutant emissions from yard maintenance activities and recreation activities
- Make local air quality information accessible to decision makers
- Make air information available to all citizens and businesses

Next steps for Comox Valley

The Regional Airshed Roundtable began with a meeting of the Steering Committee on June 18, 2020. This group is being supported by an Air Quality Coordinator (Pinna Sustainability) hired by the Comox Valley Regional District, and staff at CVRD. The following next steps will be taken to launch the work of the Regional Airshed Roundtable:

Year 1:

- **September 2020**: Regional Airshed Roundtable will meet for the first time, including members of the Steering Committee and those invited to the Roundtable.
- **Fall 2020**: State of the Air Memo to be published with a FAQ for public forthcoming in early 2021.
- **Fall 2020-Spring 2021**: Meetings of the Roundtable and Steering Committee to begin the development of the airshed strategy. Communications provided to the residents of the Comox Valley on the current events and actions of the Roundtable. The primary means of communication will be through the project webpage at www.comoxvalleyrd.ca/airshedroundtable.

Year 2:

- Conduct public engagement to inform the strategy development.
- Roundtable and Steering Committee complete the airshed strategy.
- Continue to develop and share communication material with the public.
- Identify and apply for funding to support key initiatives.

Year 3:

- Coordinate and advocate for implementation of the strategy actions.
- Continue to share communication material with the public.
- Continue to seek funding to support key initiatives.

Concurrently, during winter 2020 the CVRD's 2020 Wood Smoke Reduction Program will continue to communicate and engage with the public about reducing emissions from wood smoke, with a focus on wood stoves and open burning.

Appendix A: Airshed Roundtable and Steering committee membership

Airshed Roundtable

The purpose of the Regional Airshed Roundtable is to:

- Help establish shared priorities through issue identification;
- Offer potential solutions to issues identified;
- Help inform public policy on clean air in the region;
- Provide advice and support to the Steering Committee;
- Share information with the organizations / groups that they represent.

Airshed Roundtable Participant Organizations:

- Breathe Clean Air Comox Valley
- Chamber of Commerce
- Comox Valley Community Health Network
- Comox Valley Farmers' Institute
- Comox Valley Fireplace and Patio
- Comox Valley Nurses for Health & the Environment
- Comox Valley Regional District
- Cumberland Community Forest Society
- Elemental Energy Advisors
- Focused Energy Assessments
- Hancock Natural Resource Group
- Hearth, Patio, & Barbeque Association of Canada
- Norse Heating
- Mid Island Farmers' Institute
- Vancouver Island Health Authority (Environmental Health)
- Vancouver Island Health Authority
- 6 members of the general public
- Town of Comox*
- Peakflow Energy Solutions*
- Fire Chiefs Association*
- Mosaic Forest Management*
- CVRD's Integrated Regional Transportation Select Committee*

* Passive members: receive summary notes from Roundtable meetings and have the opportunity to provide feedback

Steering Committee

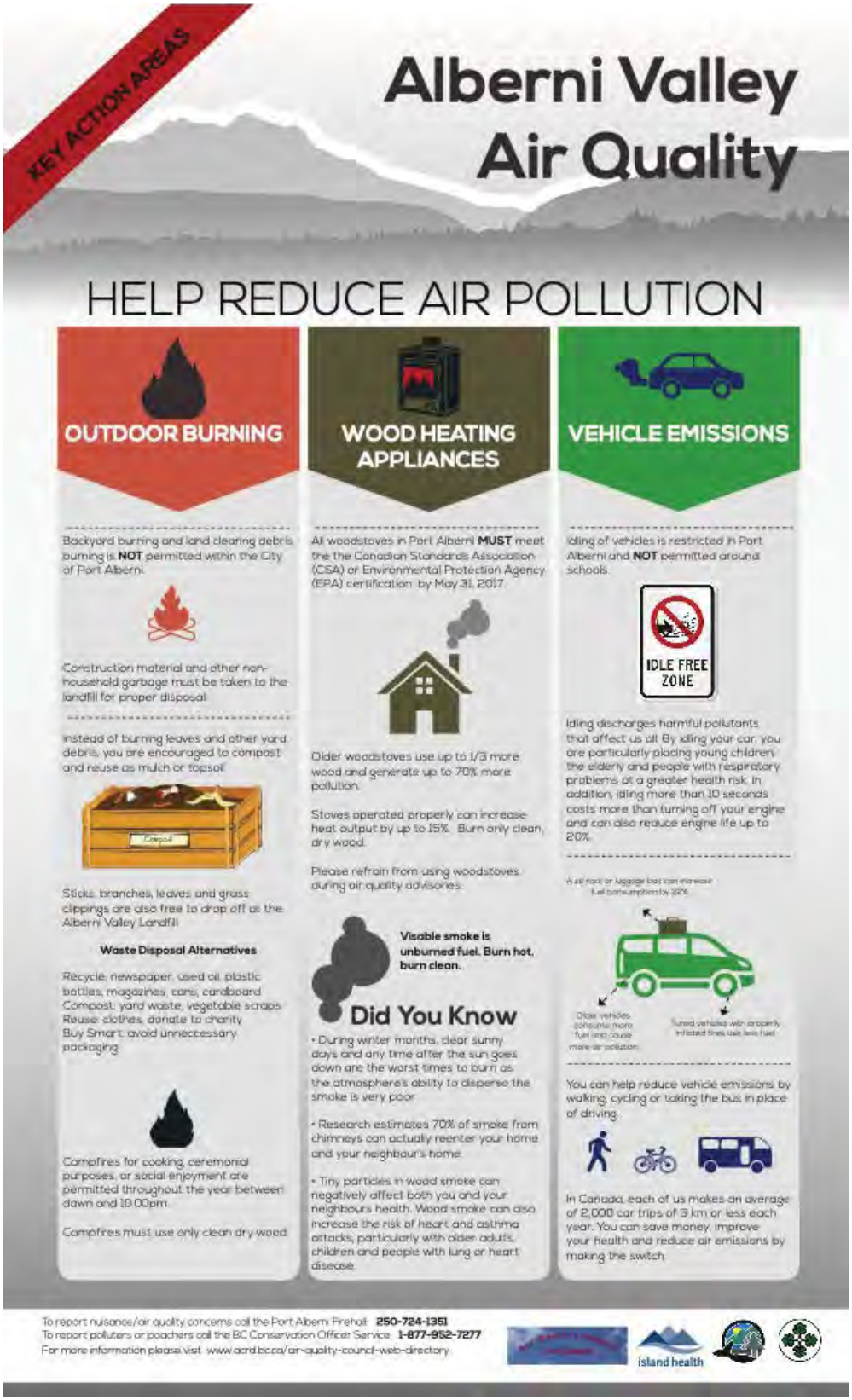
The purpose of the Steering Committee is to:

- Advance work, including setting priorities and providing direction;
- Identify gaps in knowledge, and support research and engagement to reduce those gaps;
- Support strategic planning including lending expertise;
- Act as champions for air quality management in the Comox Valley.

Steering Committee Participant Organizations:

- Comox Valley Regional District
- City of Courtenay
- Village of Cumberland
- BC Wildfire Service, Forest Lands Natural Resource Operations and Rural Development
- Air Quality Section, BC Ministry of Environment and Climate Change Strategy
- Air Quality Section, BC Ministry of Environment and Climate Change Strategy
- Vancouver Island Health Aughority
- Applied Environmental Research Lab, Chemistry, Vancouver Island University
- Town of Comox
- K'ómoks First Nation

Appendix B: Example – Port Alberni Air Quality Action Areas Infographic



Appendix D – Vision and Goals

Comox Valley Airshed Roundtable

Draft Vision, Principles and Goals for the Airshed Protection Strategy

May 6, 2021

This document summarizes the current draft Vision, Principles and Goals for the Comox Valley Airshed Protection Strategy. It represents the input and review from Airshed Roundtable members and Steering Committee members. As a next step, members of the Airshed Roundtable and Steering Committee will form working groups to begin identifying strategies to achieve the goals.

Draft Vision Statement

> ***The Comox Valley has clean air that supports the health of all residents.***
>
> *Currently, the Comox Valley experiences recurring periods of poor air quality that negatively affect the health of our communities. Achieving this vision is complex and will require **coordinated efforts** from several governments, organizations, industry, and community members. Our actions need to be effective in order to **continually improve air quality**, with an initial focus on reducing **fine particulate matter** – the air pollutant of greatest concern to the health of our Comox Valley communities.*

Draft Strategy Principles

The following principles will guide the development and implementation of the Airshed Protection Strategy:

- **Health protection**: Air pollution disproportionately affects some members of our community. We will work together to ensure the best air possible for all residents in all areas of the valley, focusing on protecting the health of our most vulnerable.
- **Accessible and affordable**: Reducing emissions may involve actions or investments that are not accessible or affordable to everyone. We will work to identify ways to improve access to and affordability of options that help clean our air.
- **Innovative and evidence-based approaches**: Our efforts will be based on the best available science, evidence and practices, and we will build on this information to test innovative approaches to achieve our vision.
- **Minimizing contributions to climate change**: We recognize the urgency of climate change and its potential effects on the health and well-being of our residents. We also recognize that air pollution and climate change are closely linked. Therefore, we will ensure our efforts to minimize air pollution simultaneously minimizing greenhouse gas emissions where applicable.

Comox Valley Airshed Protection Strategy: Draft Vision and Goals from Roundtable input

Draft Goals

1: Achieve measurable reductions in fine particulate matter levels

1A. Reduce emissions from existing residential wood-burning appliances

1B. Transition away from biomass heating systems in residential neighbourhoods

1C. Eliminate burning of yard waste in residential neighbourhoods

1D. Promote and advocate for alternatives to open burning outside of residential neighbourhoods

1E. Reduce emissions from transportation, focusing on sources of $PM_{2.5}$

2: Effective coordination of our efforts

2A. Build partnerships and align efforts across participating organizations

2B. Continually expand our knowledge of local pollution sources and impacts to inform our efforts

3: Educate and involve the community in understanding and reducing the impacts of air pollution

Preliminary sub-goals still in development:

3A. Facilitate a better understanding of the connection between air quality and health

3B. Support knowledge transfer through public events

3C. Support community engagement and links to educational opportunities