Cowichan's Regional Airshed Protection Strategy

2023 Update

A partnership of: Cowichan Valley Regional District, Cowichan Tribes, Ministry of Environment and Climate Change Strategy, Island Health, Our Cowichan Communities Health Network, School District 79, Paper Excellence, University of Victoria, City of Duncan, Town of Ladysmith, Town of Lake Cowichan, Municipality of North Cowichan and Cowichan Fresh Air Team - as of December 2022.

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This strategy has been referred for comment to the following organizations and will be included in future programing for action as per the identified roles and responsibilities laid out. Each of these organizations will be invited to participate in meetings of the Cowichan Airshed Protection Round Table.

- Ministry of Environment and Climate Change Strategy
- Ministry of Forests, Lands & Natural Resource Operations
- Ministry of Transportation and Infrastructure (Victoria)
- Ministry of Agriculture
- BC Transit
- Island Health
- Managed Forest Council
- Cowichan Tribes
- Ditidaht First Nation
- Halalt First Nation
- Ts'uubaa-asatx First Nation
- Lyackson First Nation
- Malahat First Nation
- Pauquachin First Nation
- Pacheedaht First Nation
- Penelakut First Nation
- Stz'uminus First Nation
- First Nations Health Authority
- Our Cowichan Communities Health Network
- Cowichan Fresh Air Team
- South Island Fire Management Organization (SIFMO)
- Caycuse Volunteer Fire Department Society
- Cowichan Bay Fire Protection
- Mill Bay Fire Protection
- Shawnigan Lake Fire Protection
- Thetis Island Fire Protection
- Pacific Pilotage Authority
- School District 68
- School District 79
- Municipality of North Cowichan
- Town of Lake Cowichan
- Town of Ladysmith
- City of Duncan
- Paper Excellence
- Mosaic Forest Management
- Hancock Forest Management
- CVRD Operations Department
- CVRD Land Use Services Department
- CVRD Inspections and Enforcement Division
- CVRD Waste and Recycling Management Division
- CVRD Emergency Management Division

Additional organizations that are interested in participating in the proposed Regional Airshed Protection Round Table will be added to this list and invited to the meetings.

This report outlines an updated Regional Airshed Strategy for the Cowichan Valley Regional District (CVRD). It identifies the necessary actions to be undertaken in order to develop an effective response to dynamic air quality concerns in the region. This work is consistent with and taken based on direction in the 2020 to 2022 CVRD Corporate Strategic Plan which specifically directs that the airshed protection strategy be reviewed and updated. Given this is an area in which many players are involved the CVRD has taken the lead role in the development of the strategy update in coordination with the MOE, however the implementation will require strengthening the ongoing coordinated response from many.

Aaron Stone – Chair Cowichan Valley Regional District

What is the air quality problem in our Region?

In the Cowichan, the air contaminant of greatest concern is $PM_{2.5}$, which refers to particulate matter that is less than 2.5 microns in diameter. This is the particulate matter of greatest concern because it can travel deep into the lungs and become lodged there, causing heart and lung disease, and premature death. Fine particles that comprise $PM_{2.5}$ are also efficient at scattering light, resulting in degradation of visibility.

A 2023 Air Quality Study for the Cowichan region has shown a downward trend in the number of days with PM2.5 levels exceeding the provincial acceptable limit from 2010 to 2021, which indicates improving air quality over this time period. Nevertheless, the 2023 Study has also indicated that occasional PM2.5 exceedances still occur in the winter primarily due to local open burning and wood burning appliances, as well as in the summer due to wildfire smoke. An emissions inventory completed in 2014 estimated that 77% of the total PM2.5 in the Region is coming from area sources. Open burning accounted for 53% of the total PM2.5 and wood burning appliances accounted for 23% of the total PM2.5.

Our History

Air quality concerns in our Region are rooted in local history. The primary sources for PM2.5 include open burning and wood burning appliances. However, the burning of wood debris for clearing land and the use of wood stoves for residential heating has been happening for generations.

There is something about the smell of wood smoke and the warmth of heat from a fire that is comforting for people. In our region, it is part of our history of living off the land. People will say: "My parents burned wood and my grandparents burned wood, why wouldn't I?" Today, we know about the health effects of wood smoke. And today, the technology and practices exist to do it better.

TW Paterson – local historian and author of over 26 books on BC History

Wild fires have also been contributing to air quality concerns throughout our history. In 1938, a cloud of smoke one mile high covered two-thirds of Vancouver Island and was reported as far south – 640 km – as Portland Oregon. Its fly-ash was so thick that two ships collided off Port Angeles. This was the product of Vancouver Island's worst forest fire ever, the Great Fire (so-called) of 77 years ago which burned an area of approximately 350 square kilometers.

Image mcr020399-7 courtesy of the Museum at Campbell River

Image mcr020399-16 courtesy of the Museum at Campbell River

Why are we concerned about air quality?

There is solid scientific evidence at a national level of a strong link between air pollution levels and impacts on human health. Locally, data from Island Health indicates that **in the Cowichan Local Health Area, admissions rates for children with respiratory diseases averaged 75% higher than provincial rates** for the period 2001 to 2018. The **prevalence of chronic respiratory illness for all persons aged 35 and over was 55% higher in Cowichan Valley Regional District than the province** for the period 2001 to 2017.

In our region, air emissions originate from a wide range of sources including mobile vehicle emissions, stationary industrial point sources, residential or commercial area sources and natural sources. There is also a wide range of types of contaminants being emitted. For common air contaminants such as particulate matter (PM) and ground-level ozone, health impacts have been found even at low concentrations, indicating that there may be no safe level. The elderly, the young, those with lowered immunity, and/or existing heart and lung ailments are especially vulnerable.

Air pollution also affects the integrity of natural ecosystems and agricultural crops, increases greenhouse gas emissions and degrades the visibility of scenic vistas. Together with the health costs, these impacts and their consequences for tourism and other industries have implications for economic activity throughout the region.

What is an airshed?

The term “airshed” is used to describe an area where the movement of air tends to be hindered by the local geography and by weather conditions. The most obvious examples of an airshed would be the Cowichan, the Shawnigan, Chemainus Basins or even the larger Georgia Basin. Airsheds are not confined to political boundaries and they can be at multiple scales depending on a variety of variables such as geography, dominant wind patterns or weather.

During temperature inversions, a common event in our region, the cooler air near the ground is trapped by warmer air aloft. The effects and duration can be much different depending on the season. The types of emissions that accumulate in the surface layer will vary according to seasonally related activities such as summer traffic, winter home heating with woodstoves or open burning in the fall.

In contrast, when the air is well mixed and winds are moderate, pollutants are quickly dispersed. In some cases, the pollutants and their by-products may be transported long distances beyond the airshed. This is a reminder that everyone and their activities are globally interconnected and that our local conditions are to some extent affected by issues elsewhere. The region experiences impacts to air quality from a wide variety of events including fires in Europe, central BC and other areas, dust storms in Asia and the combustion of fossil fuels by mobile sources and large facilities in neighboring regions.

For the above reasons, many of our communities are prone to periods of poor air quality. As global and regional emissions increase and local ground temperatures increase as a result of global climate change, air quality is expected to continue to worsen over time.

luding adversely affecting human health, the environment and visibility.

imodate desirable and potential growth. Fortunately, action at the local level can be taken to reduce local consequences.

Addressing Air Quality Concerns by Airshed Planning

Local, regional and provincial governments have developed and applied various approaches to combat and control air pollution. Among these, airshed planning has emerged as an important tool for dealing with multiple pollution sources that involve numerous stakeholders and, in some cases, cross political boundaries. Airshed planning is a stakeholder-driven process to coordinate the abatement of activities affecting air quality in a defined area or airshed. It recognizes that local air quality is influenced by a myriad of activities and sources, including industry, transportation, commercial and residential development, wood smoke, road dust, and natural circumstances. Since no one jurisdiction controls all these sources, a collective approach to air quality protection is needed that engages a variety of organizations and individuals and, where necessary, encourages partnerships with neighbouring communities in developing and implementing local solutions.

To date, all such efforts in BC have been voluntary in nature, in keeping with a shared stewardship approach. Currently, there are 14 airshed plans that have been completed for various airsheds in the province, with some variation in key areas, objectives, and mechanisms. The issues and ability of key players in the region will affect the level and speed of implementation of a regional strategy. As such it is important that the development of such a strategy include the participation of a broad range of participants working in a coordinated fashion.

Why pursue a Community Based Approach?

Because the impacts of poor air quality affect such a broad spectrum of the community and originate from a variety of sources a multi stakeholder process is necessary in order to address sources effectively. This will require that all affected organizations and entities are aligned and coordinated so that policies, actions and ongoing monitoring is effective and strategic in nature. No one entity is charged with the issue nor can any individual action address its effects in a meaningful way.

Existing programs and policies in the region are already contributing towards air quality management objectives (e.g., energy and climate action planning, transportation planning, open burning bylaws, wood burning appliance programs). As such, the emphasis of the proposed strategic process will be on supporting and expanding these existing initiatives.

The value of partnerships for airshed protection is illustrated by successes already achieved in the Region including:

- the establishment of the Cowichan Region Airshed Protection Roundtable including the development of terms of reference and capacity building program
- a neighbourhood air quality sensor network
- a citizen air quality awareness campaign including posters and postcards deployed to public spaces across the region
- backyard burning regulations in 6 electoral areas and 4 municipalities,
- a woodstove exchange program that has supported the upgrade or replacement of 1189 woodstoves

- the *clear the air cowichan* communications materials
- a series of 5 articles on wood smoke in the local newspaper
- partnership with UVIC researchers to undertake initial nephelometer study
- partnership with MOE that allowed for the technical background required to backstop this (emissions inventory, air quality study for the CVRD)
- current partnership for installation of additional regional monitoring stations across region (total now 4)

These programs were all delivered through a collaboration of several provincial government, local government, academic and stewardship organizations. If it is possible to achieve a coordinated alignment it will be possible to ensure that future planning and programing builds effectively on the overall goals and identified actions. And enforcing the philosophy of collective impact, shared interests and shared responsibility which will be a keystone for long term and stable policy development and community health objectives.

Participants

Contributions from the various organizations involved in local air quality management are key to the successful design and implementation of an Airshed protection strategy. To date a number of ongoing discussions have occurred in the region and most recently planning discussions were hosted by the MOE and the CVRD in 2014 and 2015 to bring together a focused Roundtable group to develop a collaborative Airshed Protection Strategy for the region and its affected populations. Each organization has interest in moving forward on the development of a Regional Airshed Strategy as a sub component of the Regional Sustainability and Health Strategies. This strong message provided the impetus to MOE and the CVRD to partner on the development of the necessary background studies (attached as appendices A and B).

The Round Table gathered over a number of meetings in 2014 and 2015 and discussed the overall issues affecting air quality in the region. Based on the insights gathered through these discussions, the CVRD and the MOE partnered to develop additional background material and identification of specific contaminants, appropriate indicators and draft targets for the groups discussion (see appendices C and D).

Based on a structured process the group then identified specific goals, actions and the identification of key leaders and supporting organizations. The following Action Plan is the result of that work and will form the combined efforts of the collaborative in achieving *our vision*.

Our Vision

Working together for clean air to support our health, our environment and our communities

Our goals, targets and objectives

Airshed planning and implementation will be an ongoing effort of many. While a number of high priority goals have been identified, it is recognized that this will be an ongoing process of refinement over time. Short term and long term actions are summarized below then in more detailed tabular format. Key targets have also been included. The complete set of indicators and targets is provided in Appendix C.

Goal #1 – Protecting Human Health

We will protect and improve regional air quality so our communities are as healthy as possible.

Key Targets

- Zero exceedance of 24 hour BC AAQO for $PM_{2.5}$ (25 ug/m^3)
- Zero exceedance of annual BC AAQO for $PM_{2.5}$ (8 ug/m^3)

Objectives

- Reduce $PM_{2.5}$ emissions from local open burning including land clearing burning and backyard burning
- Reduce $PM_{2.5}$ emissions from wood burning appliances
- Support programs that reduce emissions from mobile and point sources[1] of all targeted pollutants (PM_{10}, $PM_{2.5}$, SO2, NOx, CO and VOC)

Key Actions – High Priority

- Raise public awareness on the health impacts of wood smoke, the alternatives, the best practices and the rules.
- Establish Clean Air Shelters
- Develop consistent airshed wide regulatory approach for open burning
- Explore options for a curbside pickup of yard and garden materials to overcome barriers to open burning alternatives.
- Develop airshed wide regulatory approach for wood burning appliances
- Enhance incentive programs for wood burning appliance upgrades and replacement to other modes of heating to encourage replacement.

Supporting Actions – Medium Priority

- Reduce vehicle idling through policies and education
- Support alternative modes of transportation
- Reduce stop and go traffic on the Trans-Canada Highway
- Reduce dust emissions in communities adjacent to dirt roads
- Compliance with federal and provincial regulatory requirements by point source emitters[1].

Participants

- Lead roles for the Ministry of Environment, Island Health, First Nations, Our Cowichan - Communities Health Network, Municipalities, the CVRD and other local governments.
- Support from all Airshed Protection Round Table participants

[1]A point source emitter is a single, stationary source of pollution, such as an industrial facility, that typically operates under some kind of government authorization.

Goal #2 – Building Strong and Collaborative Partnerships

We recognize that many players are critical to true partnerships and we will work towards coordinating our efforts to achieve the objectives and benefits clean air provides our community.

Key Targets

- Formation of an Airshed Protection Round Table with Terms of Reference and Annual Reporting

Objectives

- Implement the actions in this strategy
- Annual monitoring and reporting of progress towards the goals, targets and objectives of the strategy

Key Actions – High Priority

- Collaborative development of work plans for the actions identified in this strategy.
- Annual reporting by the Round Table participants on progress towards meeting the objectives in the Strategy.

- Periodic assessment of whether the strategy should focus on other pollutants of interest
- Regional Air Quality Monitoring and Information Gathering.
- Develop existing and new linkages to climate change, wildfire (bc *FireSmart*), transportation and solid waste planning processes.
- Develop leadership capacity and skills for driving community and systems change

Participants

- All Round Table participants and other organizations that can improve air quality in the Region.

Key Actions

Goal #1: Protecting human health

We will protect and improve regional air quality so our communities are as healthy as possible.

The tables provide prioritization of initiatives and tasks that will help us achieve our goals. Prioritization is based on resources need, enforceability, community support for action and health benefit.

Objectives:

- Reduce emissions from local open burning including land clearing burning and backyard burning
- Reduce emissions from wood burning appliances
- Reduce exposure to high levels of all sources of PM2.5 including wildfire smoke

#	Action	Description	Tasks	Progress	Timeline	Overall Priority
1	Raise public awareness on the health impacts of wood smoke, the best practices, the alternatives and the rules.	**Implement Airshed Communications and Engagement Road map** to deliver a community-based social marketing approach to bring about behavior change.	Run AQ article series again. **Lead:** CVRD - ENVSD, MoE Health Network. Explore community air quality forums. **Lead:** Our Cowichan, CVRD - ENVSD, MoE Launch web portal for Air Quality. Lead: CVRD - ENVSD **Release survey question to public to collect data on type of home heating across the region, through regional health survey. Lead: OCCHN** **Develop Network of Community Champions. Lead: All** **Wood burning appliance public outreach. Lead: CVRD Recycling and Solid Waste** • **Distribute Island Health and MOE, Air quality and wood burning appliance video** • **Consider promotion of Fraser Basin Council Course for Wood burning appliance use** • **Develop and release updated posters and postcards. Leverage BC Lung Foundation and MOE communication materials** **Open burning outreach – Lead: CVRD ENVSD**	**Ongoing** 2015, BC Lung hosted an Air Quality Forum in Duncan. MoE, UBC, BCCDC and CVRD were presenters. 2016, the CVRD developed a web space → www.cvrd.bc.ca/air A woodsmoke article series are linked to this website. 2017, The CVRD has worked with partners to install PurpleAir sensors to understand wood smoke patterns in various neighborhoods. The project including developing communication tools. 2017, the CVRD worked collaboratively with partners to develop an Airshed communications strategy that will guide airshed protection communication activities. 2019 Island Health and MOE, Air quality and wood burning appliance best practices video 2019 Fraser Basin Council Course for Wood burning appliance use	**Short** 1 to 2 years	**High**

			• **Promote existing updated posters and postcards. Leverage BC Lung Foundation and MOE communication materials**			
2	Establish Clean Air Shelters	**Establish clean air shelters including a room/area or an entire building that has a filtration system to minimize the amount of outdoor air that is entering the building/space.**	• Establish partnerships and develop policies and procedures to use community spaces for this purpose (prioritize new/retrofitted spaces where possible). • Identify the best sites to locate these clean air shelters within the community, targeting vulnerable populations. • Establish clear communication strategies for vulnerable populations • Conduct a more in-depth social inventory to better understand who the vulnerable people are in the community and what additional support they might need in the face of this climatic event. **Lead: TBD**	**Pending** Indoor Purple Air Sensors being installed at CVRD offices and recreation centers.	**Short** 1 to 2 years	**High**

Objective: Reduce emissions from local open burning including land clearing burning and backyard burning

#	Action	Description	Tasks	Progress	Timeline	Overall Priority
3	Develop consistent airshed wide regulatory approach for open burning and assign appropriate enforcement resources	Explore **complete ban on backyard burning** for additional high density (urbanized) areas in the Region.	Review of Official Community Plan (OCP) issues concurrent with MOCP process and Solid Waste Management Plan process **Lead:** CVRD – Recycling and Solid Waste, MoE and Municipalities. Explore an update to open burning bylaw(s) in the Region to include prohibition of any open burning **on zoned agricultural land and ALR** land as long as it is not 'a normal farm practice' **Lead:** CVRD – Recycling and Solid Waste, MoE and Municipalities. Update bylaws **Lead:** CVRD – Recycling and Solid Waste, MoE and Municipalities.	**Pending** In 2017, Backyard burning bylaw matrix developed and presented to the CVRD board for information	**Medium** 3 to 5 years	**High**
4	Explore options for a **curbside pickup of yard and garden materials**	**Establish a program for yard and garden materials pickup in a higher density neighborhood of the CVRD.**	• Explore feasibility including costs and benefits for a yard and garden pickup including: ○ options for commercial or multi-family residential organics ○ Consider breaking up the two waste streams for more specific management objectives. **Lead:** CVRD – Recycling and Solid Waste	**In progress** In 2017, as a first step, CVRD Staff have worked with Consultants Madrone Environmental Services to complete the Open Burning Emissions Reduction Study to understand priority areas for management of open burning and identification of options to reduce	**Medium** 5 years	**High**

	to support the alternative to backyard burning.	`	Seek direction from the Board and Report back to task force by 2016. **Lead:** CVRD • Explore the pilot use of a fee for service air curtain burner and wood chipper. **Lead:** CVRD – Recycling and Solid Waste	emissions. The Study provided key information including: • The determination of the potential for generation of land clearing debris within CVRD Electoral Areas and current and potential hotspots for backyard burning • The identification of best practices for managing land clearing debris and residential yard and garden materials Feasibility assessment was complete in 2021 In 2022, the CVRD is exploring community support for potential roll-out of pickup program in 2024. Opportunities for disposal of high risk invasive species to be included.		

Objective: Reduce emissions from local open burning including land clearing burning and backyard burning						
#	**Action**	**Description**	**Tasks**	**Progress**	**Timeline**	**Priority**
5	Develop airshed wide regulatory approach for wood burning appliances	Establish a model wood burning appliance bylaw for the region. Explore expansion of options already adopted by some areas to other high density areas. Options include: • During AQ advisory, no woodstoves may be used, except to heat homes with no other form of heating • Upon sale of house, non-certified woodstoves must be upgraded or removed.	Develop and implement a model wood burning appliance bylaw • Inventory of woodstoves in the region by spatial locations and age. • Further develop an understanding of the use of woodstoves in economically challenged households. • Study the neighborhood $PM_{2.5}$ *levels* in more densely populated areas (e.g. mobile home parks) • Request an update from the province regarding the changes to legislation required for real estate transactions • Expand and support the burn it right program • Explore and make recommendations on the expansion of wood burning bylaws in other high density areas • Legal review of woodstove ban in new homes. **Lead:** CVRD – Recycling and Solid Waste and municipalities	**Pending**	**Medium** 5 years	**Medium**

		• Only certified woodstoves / **woodstoves only for emergency use / no woodstoves** may be installed in new builds				
6	Enhance incentive programs for wood burning appliance upgrades and replacement to other modes of heating to encourage replacement.	• Explore additional sources of funding for incentives. • Promote other sources of funding for incentives including the Clean BC rebates.	• Continue wood burning appliance upgrades at a pace established in action above. **Lead:** CVRD – Recycling and Solid Waste • Explore additional incentives to overcome financial barrier of upgrades. CVRD – Recycling and Solid Waste • Expand woodstove switch out program to include incentives for transition to alternative modes of heating. **Lead:** CVRD – Recycling and Solid Waste, MoE	**Complete** In 2017, 2018, 2019, 2020 and 2021, the CVRD offered rebates of for replacing a wood stove with a heat pump. The 2021 rebate is $2,000 including $1,850 from the province and the CVRD and $150 from the retailer. Each year the program has included education on the health impacts of poor air quality and the promotion of the woodstove replacement program through print and digital media. In 2022, advertising will be updated to include availability of up to $6,000 through local, provincial, federal government grants and retailer top up.	**Medium** 5 years	**High**
7	Promote use of alternative energy sources and systems	Promote alternative energy pilot programs and grant programs.	• Include information on alternative energy source and systems in public awareness campaign. **Lead:** CVRD ENVSD, CVRD – Recycling and Solid Waste, and Our Cowichan Communities Health Network. • Contribute air quality information to solar energy stewardship community as they engage the community. **Lead:** CVRD ENVSD, CVRD – Recycling and Solid Waste, and Our Cowichan Communities Health Network	In 2016, the CVRD has installed a solar array at the Bing's recycling and waste facility. The annual power production of the array is estimated at 23,000 kWh (enough power for 4 homes). In 2020, THE CVRD completed development of the Home energy retrofit Strategy including promotion of incentives for replacement to Heat Pump.	**Short** 1-2 years	**High**

Goal #2: Building strong and collaborative partnerships

We recognize that many players are critical to true partnerships and we will work towards coordinating our efforts to achieve the objectives and benefits clean air provides our community.

Objectives:

- Develop Terms of Reference for the Airshed Protection Round Table
- Implement the actions in this strategy
- Annual monitoring and reporting of progress towards the goals, targets and objectives of the strategy

#	Action	Description	Tasks	Progress	Timeline	Priority
1	Develop Work Plans for high priority actions	Develop work plans for the high priority actions identified in this strategy. Identify supporting processes for the medium priority actions identified in this strategy	• Task force to meet annually to report out and develop 2 year work plans **Lead:** Varies according to action • Invitation to participate to be extended to additional participants: **Lead:** Roundtable facilitator	**Ongoing** Roundtable meetings held twice a year and working group meetings held on an as needed basis to develop work plans for the airshed protection strategy actions.	**Soon** 1 to 2 years	**High**
2	Periodic Reporting and Monitoring	Annual reporting by the Round Table participants on progress towards meeting the objectives in the Strategy.	• Decision and recommendations on monitoring and reporting framework to be developed **Lead:** CVRD and Our Cowichan • Annual reporting and task force meeting and communications schedule to be discussed for recommendations **Lead:** Roundtable facilitator	**Ongoing** The next meeting of the Roundtable is scheduled for the Fall of 2021. It will include an opportunity for progress updates from participants.	**Soon** 1 to 2 years	**High**
		Periodic assessment of whether the strategy should focus on other pollutants of interest.	• Review whether strategy should focus on other pollutants of interest. **Lead:** MoE • Establish review cycle and process. **Lead:** MoE	**Ongoing** Strategy update taking place during 2021 and 2022.	**Medium** 3 to 5 years	**High**

		Regional Air Quality Monitoring and Information Gathering	• MOE will provide air monitoring stations and technical support via a MOU with the CVRD **Lead:** MoE and CVRD - ENVSD • Work with partners to implement additional short term $PM_{2.5}$ monitoring projects throughout the region. **Lead:** MoE	**Complete and Ongoing** In August 2015, the MoE installed two short-term PM2.5 monitors to examine cold season PM2.5 levels in Lake Cowichan and Shawnigan Lake. In 2016, the MoE installed short-term PM2.5 monitors in Ladysmith. In 2018, the CVRD, MOE and School District installed purple air sensors in neighborhoods throughout the region. In 2022, the CVRD began installation of indoor Purple Air Sensors at the CVRD offices and recreation centres.	**Short** 1 to 2 years	**High**
3	Develop existing and new linkages to Modernized OCP, climate change, transportation, wildfire and solid waste planning processes.	Have Airshed Roundtable participants join OCP review, climate change strategy, transportation planning, wildfire (bc firesmart), solid waste planning and land use referral discussions.	• Preliminary presentations to task force with proposed issues and linkages by invited representatives **Lead:** Various participants • FireSmart community awareness program. **Lead:** CVRD	**Complete and Ongoing** Through presentations and forums, the CVRD has promoted FireSmart principles in the community. In 2020, the CVRD established the Climate Change Adaptation and Risk Management Strategy which includes an action to update the Airshed protection strategy.	**Short** 1 to 2 years	**High**
4	Develop leadership capacity and skills for driving community and systems change			**Ongoing** In 2017 The PlanH healthy communities grant supported leadership and capacity building.	**Short** 1 to 2 years	**High**

Actions addressing other pollutants

The following actions are considered to be **medium priority** for the following reasons:

- they could lead to a relatively large reduction in targeted contaminants including Nitrogen Oxides (NOx), Carbon Monoxide (CO) and Volatile Organic Compounds (VOCs); and/or
- they could lead to a relatively small reduction in $PM_{2.5}$; and/or
- the actions are beyond the direct control of representatives of the Airshed Protection Round Table

Objective: Support programs that reduce emissions from mobile and point sources of all targeted pollutants (PM_{10}, $PM_{2.5}$, SO_2, NOx, CO and VOC)						
#	**Action**	**Initiative**	**Who?**	**Tasks**	**Progress**	**Overall Priority**
1	Reduce vehicle Idling through policies and education	• Review anti-idling policies and programs for potential use in the region, CVRD - ENVSD • Identify organizations and companies with/without policies. Extend invitations to support anti-idling policies for companies that do not have one • Provide anti-idling resources to organizations (e.g. free anti-idling signs for store parking lots)	Stewardship Community, CVRD - ENVSD, Municipalities, Island Health	Report to Roundtable **Lead:** *To be determined*	**In progress** The City of Duncan has already adopted an anti-idling bylaw. The Municipality of North Cowichan is in the process of adopting an anti-idling bylaw. . An anti-idling policy and awareness program has been implemented for CVRD fleet vehicles.	**Medium**
2	Support alternative modes of transportation	Support programs that overcome barriers to	CVRD, Municipalities, Ministry of Transportation and	Local governments to report out issues and recommendations	**In progress –** Regional Active Transportation Plan being developed	**Medium**

		walking and bicycling as transportation options	Highways, Stewardship Community, Island Health	regarding active transportation. **Lead:** CVRD – Parks and Trails and Municipalities		
		Support programs that overcome barriers to electric vehicle use as a commuting option	Electric vehicle community, CVRD, Municipalities	• Round Table participants to provide support letters to electric vehicle associations. **Lead:** *To be determined* • local partners (where possible) to explore installing EVI stations in their facilities **Lead:** *To be determined*	**In progress** The CVRD exchanged the fast charge EV station at Island Savings Centre for a new *Combined Charge Station* capable of fast charging a broader group of EV models coming to the marketplace to support continued growth of EV fleets with public charging infrastructure.	**Medium**
		Raise awareness for public transit and promote ridership	BC Transit Municipalities All Round Table participants	• Roundtable partners to review how their organizations can support internally and externally the use of public transportation in their programs and public messaging **Lead:** *To be determined*	**In progress** BC Transit and the CVRD are continuously promoting local transit routes. Routes were changed in October 2016 to make more efficient operations and to add a Ladysmith-Duncan express commuter route to reduce SOV traffic in the CVRD.	**Medium**

				• Report to be brought back to the task force **Lead:** *To be determined*		

Appendix A - Emissions Inventory for the Cowichan Region

Background

Levelton Consultants Ltd. (Levelton) was retained by BC Ministry of Environment (MoE) and for the Cowichan Valley Regional District (CVRD) to compile an emissions inventory for the region. The main purpose of the 2014 analysis was to provide background information regarding which pollutants/emmission sources may be of greatest concerns and identify and individual sectors/subsectors will be key to future management actions. The regional inventory was compiled for 2011 as the base year and forecasted at five-year intervals for 2016, 2021, 2026 and 2031.

Scope

The emissions inventory was compiled for the following key pollutants of interest:

- Particulate Matter (PM), including the following size fractions:
    - Particulate matter less than 2.5 microns in equivalent diameter ($PM_{2.5}$);
    - Particulate matter less than 10 microns in equivalent diameter (PM_{10});
    - Total particulate matter (TPM);
- Carbon Monoxide (CO);
- Sulphur Dixide (SO_2);
- Nitrogen Oxides (NOx);
- Ammonia (NH_3); and
- Volatile Organic Compounds (VOCs)

No specific analysis of carbon dioxide or other Greenhouse Gasses (GHG's) was undertaken as it was outside to the parameters of this study and have been calculated as a component of the Community Energy and Emmissions Inventory (CEEI) by the Province.

The emmissions inventory identified a number of source categories including: point sources (large industrial facilities), area sources (light industrial,residential, commercial and institutional sources, agricultural activities, miscellaneous sources), mobile sources (on-road motor vehicles and non-road sources including aircraft, marine vessels, and others such as construction and lawn and garden equipment), and road dust. A summary of the emission inventory is provided below.

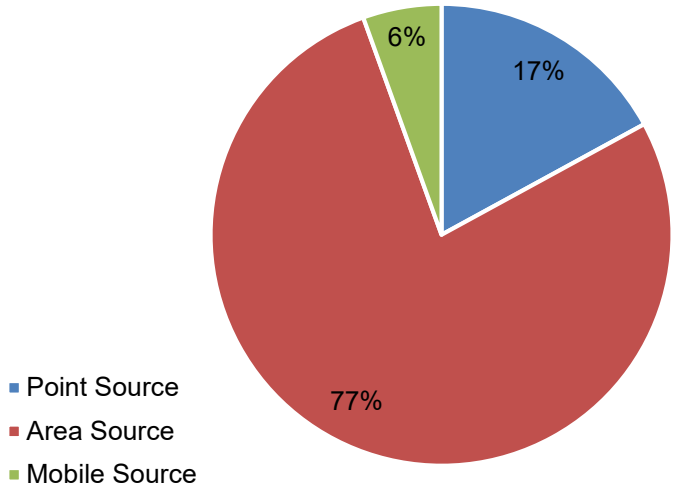
Results – where are the emmissions coming from?

The majority of TPM, PM_{10}, $PM_{2.5}$, VOC and NH3 emissions were from area sources. Mobile sources, excluding road dust, were the largest contributor of CO and NOx. The largest emitters for SO_2 were point sources.

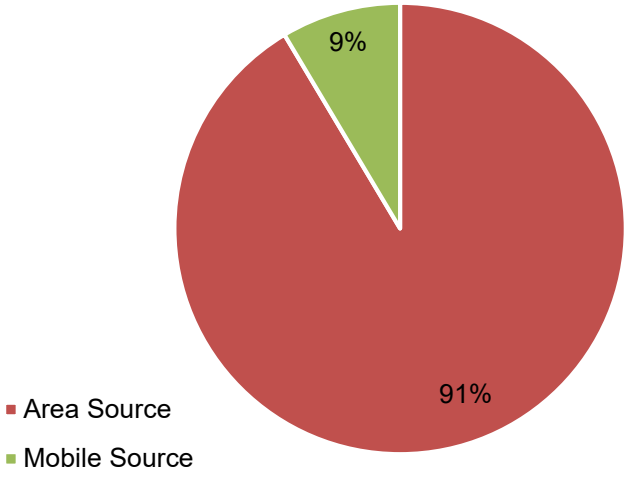
Area Sources

Overall, the majority of TPM, PM_{10}, $PM_{2.5}$, VOC and NH_3 emissions were from area sources. Open burning was the largest contributor of CO, NOx, TPM, PM_{10} and $PM_{2.5}$. VOC emissions from gasoline marketing including the distribution and sales of petroleum products at service stations and solvent evaporation accounted for approximately half of the total VOC emissions from area sources. Agricultural activities were the largest source for the regional NH_3 emissions. Space heating was the largest contributor of SO_2 emissions and second largest contributor of CO, NOx, TPM, PM_{10} and $PM_{2.5}$ emissions.

Distribution of $PM_{2.5}$ Emissions



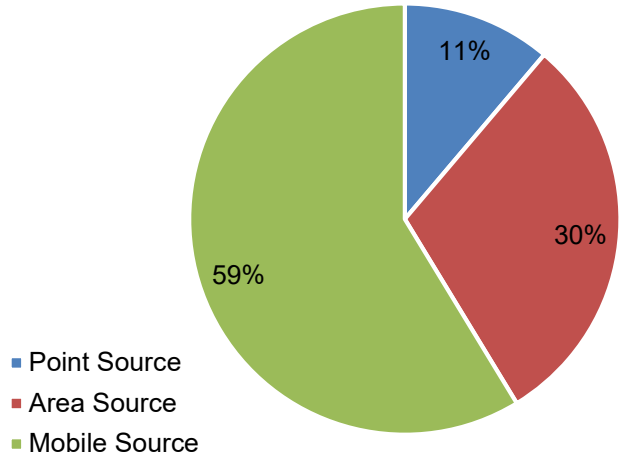
Distribution of NH_3 Emissions



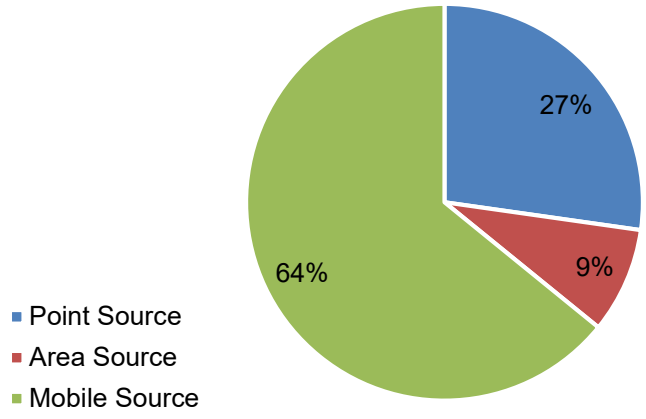
Mobile Sources

Overall, mobile sources, excluding road dust, were the largest contributor of CO and NOx. Data analyses indicated that emissions from on-road vehicles were the largest contributor of all CACs from mobile sources with the exception of NOx. Marine vessels were the largest contributor of NOx emissions from mobile sources. The second largest emission contributor to CO, TPM, PM_{10}, $PM_{2.5}$ and VOC emissions from mobile sources was non-road equipment/vehicles. CAC emissions due to aircraft activity were insignificant.

Distribution of CO Emissions

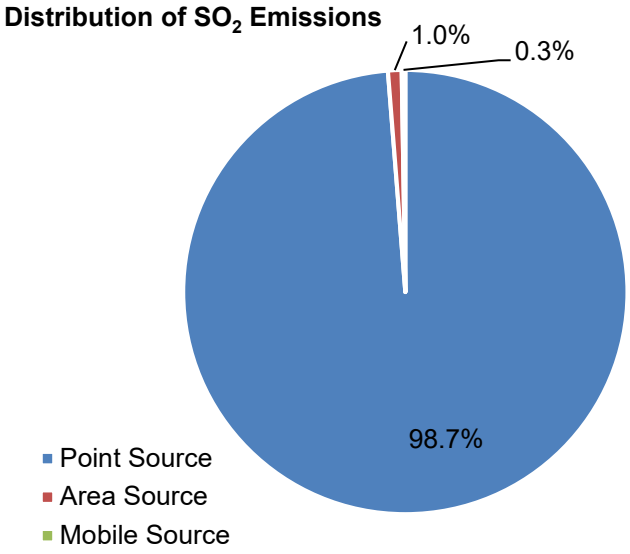


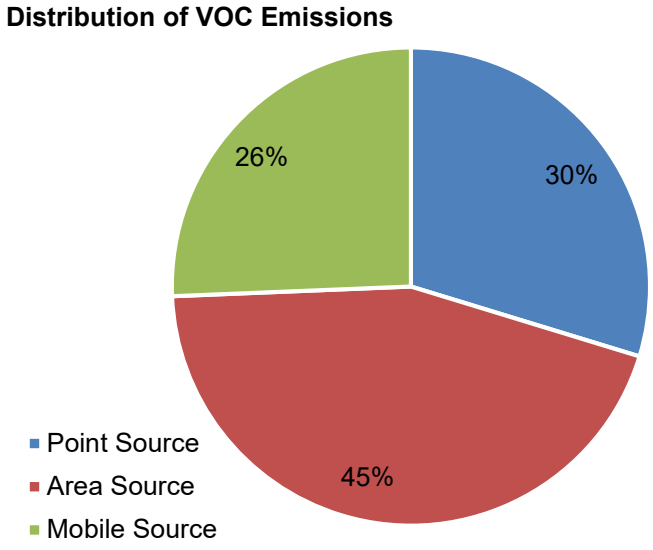
Distribution of NOx Emissions



Point Sources

Overall, the largest emitters for SO_2 were point sources. The majority of point source industry emissions were from the pulp and paper sector, which accounted for 87% of CO, 95% of NOx, 62% of TPM, 77% of PM_{10}, 86% of $PM_{2.5}$, 67% of VOC, and 99.7% of SO_2 emissions from point sources. The petroleum product storage sector was the second largest contributor at 29% in terms of total VOC emissions.





For additional details on the Emissions Inventory please visit: http://www.cvrd.bc.ca/DocumentCenter/View/65427

Appendix B - Air Quality Study for the Cowichan Region

Background

In 2023 The BC Ministry of Environment and Climate Change Solutions analyzed the meteorological and air quality datasets for the region to develop a comprehensive analyis of the impact of emissions on air quality. The study considered the 19- year period 2003 through 2021 to consolidate the most recent air quality information in support of future airshed management efforts. Statistical summaries, graphics, and case studies were used to characterize patterns in the observed air quality conditions.

Scope

Air quality datasets from four monitoring stations in the CVRD were analyzed. These include Crofton Substation, Crofton Georgia Heights, Duncan Deykin Avenue, and Duncan Cairnsmore. The Crofton Substation and Duncan Deykin Avenue stations were operational prior to 2003. Observations at Crofton Escarpment Way and Duncan Cairnsmore stations began in October 2008 and July 2009, respectively. The Crofton Elementary Station began operating in 2017.

The five substances that were measured and analyzed are: sulphur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter (PM), total reduced sulphur (TRS), and ozone (O_3). Particulate matter is further categorized by diameter into inhalable (PM_{10}) and respirable ($PM_{2.5}$) fractions. These substances are known collectively as criteria air contaminants (CACs). Air quality is determined by a comparison of the measured CAC concentrations with the national and provincial ambient air quality objectives (AAQO).

Results

For results and additional details on the Air Quality Study please visit: *link to be established*.

Appendix C – Our Indicators and Targets

The following indicators and targets were developed to help us understand whether we are achieving our goals

Parameter	Indicator	Sources	Rationale	Targets ⇨ Denotes key target	Units	Monitoring
Health	a) Childhood respiratory illness		a) Health effects	Zero	# of people	Island Health
Population	b) Resident population c) Visitors by demographic categories		b) Measure of population growth c) Measure of tourism health	N/A	# of people	Census data
Particulate matter	a) Annual average $PM_{2.5}$	Open burning and wood burning appliances	Health effects (respiratory, cardiovascular), vegetation damage, visibility degradation.	⇨ **a) Zero exceedance of BC AAQO (8 µg/m³)** & zero exceedance of National AAQO	µg/m³	Yes
	b) Daily $PM_{2.5}$		Reduce the frequency and duration of episodes that lead to *air quality advisories*.	⇨ **b) Zero exceedance *of BC AAQO (25 µg/m³)*** & zero exceedance of National AAQO		
NOx	a) Provincial and National objectives	industry, mobile sources, wood burning, etc.	Health effects (respiratory), vegetation damage, acidification, secondary particles, O3 precursor	Decreasing trend		
SO_2	a) Provincial and National objectives guideline of 7.5 ppb	Crofton Pulp Mill; combustion of fossil fuels containing sulphur. Marine Vessels.	At high concentrations - health effects (respiratory), vegetation damage, acidification, fine particulate formation, visibility	a) WHO 24 h 7.5 ppb		
Ozone	a) Provincial and National Objectives for 1 hr and 8 hr	A secondary pollutant formed from reactions between oxides of nitrogen (NOx) and volatile organic compounds (VOCs) in the	Health effects (respiratory and eyes), vegetation damage, visibility (photochemical smog)			

		presence of sunlight			
Odour	a) # of odour complaints b) TRS – Provincial Level A odour objective	Point sources Crofton pulp mill; sewage treatment; swamps, bogs and marshes.	Offensive odours	a) Reduction in odour complaints b) Continuous improvement in TRS	
Visibility	a) Visibility b) Complaints c) Good Visibility	Mobile sources Ozone, NOx, VOC and PM	can effect tourism, outdoor recreation and public perception	a) Reduction in visibility complaints b) Visibility index of good	
Partnerships & Leadership	a) Annual reports b) Partnerships c) Stewardship programs d) Public Awareness Campaign			**⇨ Form an Airshed Protection Round Table** **⇨ Implement Actions in this Strategy**	- Website hits. - #of AQ pres. given to others. # of requests for info AQ planning. - # of visitors with a positive perception of air quality and environmental health.

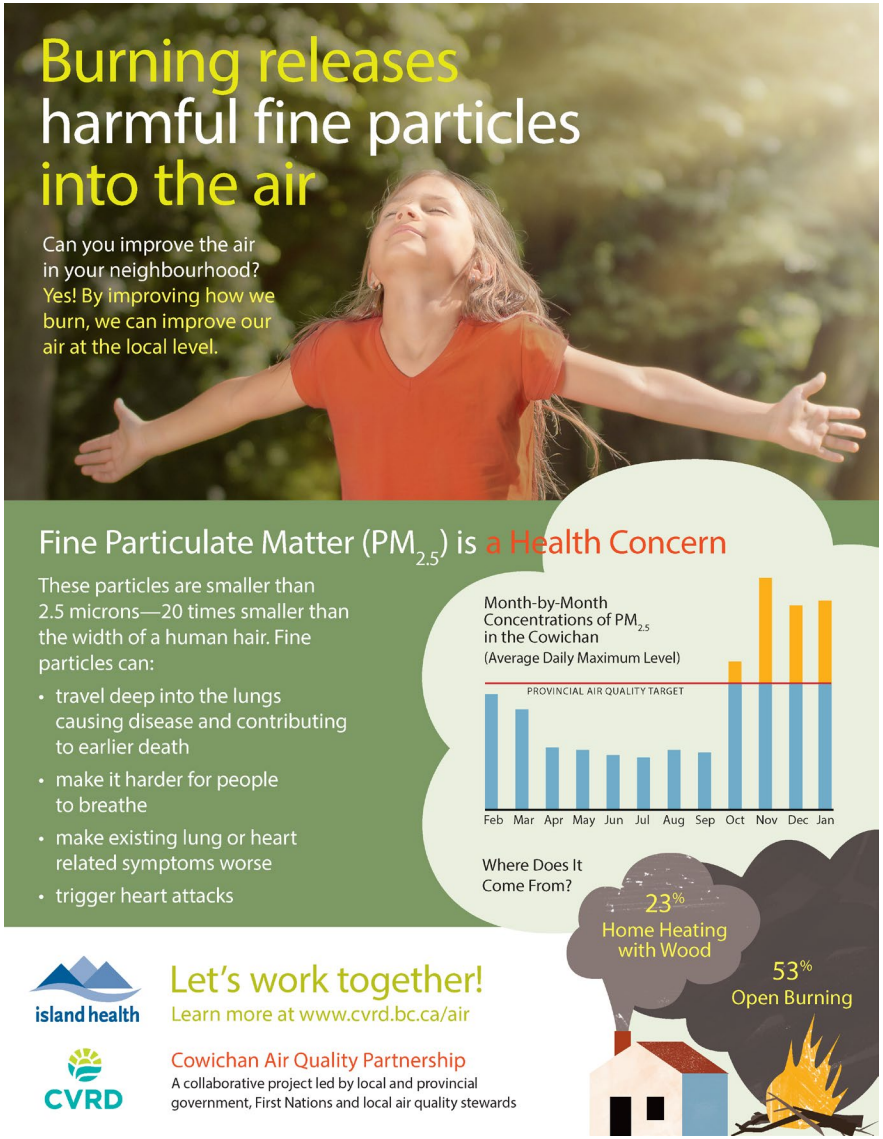
Appendix D - Contaminant Prioritization

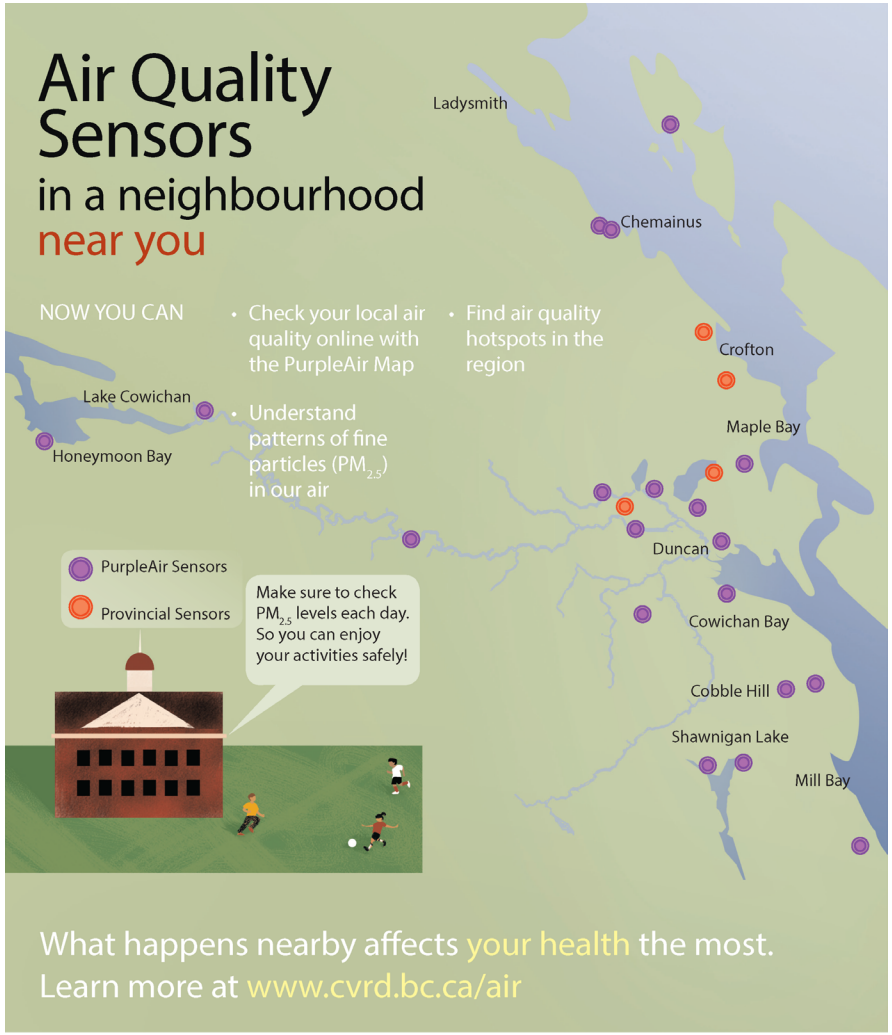
To focus the planing of actions on those that will have the greatest impact on our air quality, high priority pollutants have been determined based on the following critieria:

- Does the pollutant have exceedance(s) of national or provincial air quality objectives?
- Is the pollutant normally considered to be a significant hazard to human health, the environment or the economy?

Pollutant	Exceedance of AQ objective	Hazard		
		Human Health	Environmental	Economic
SO2		√	√	√
TRS	√			√
NOx		√	√	√
Ozone		√	√	√
PM_{10}		√	√	√
$PM_{2.5}$	√	√	√	√

Appendix E – Fact Sheets





island health

CVRD

Cowichan Air Quality Partnership

A collaborative project led by local and provincial government, First Nations and local air quality stewards

Appendix F – References

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9. Carlton, A.G., R.W. Pinder, P.V. Bhave and G.A. Pouliot. "To What Extent Can Biogenic SOA be Controlled?", Environmental Science & Technology 44:3376-3380 (2010).

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