CORPORATION OF THE CITY OF COURTENAY
COUNCIL MEETING AGENDA

We respectfully acknowledge that the land on which we gather is the unceded traditional territory of the K'ómoks First Nation

DATE: **January 21, 2019**
PLACE: **City Hall Council Chambers**
TIME: **4:00 p.m.**

K'OMOKS FIRST NATION ACKNOWLEDGEMENT

1.00 ADOPTION OF MINUTES

1 1. Adopt January 7th, 2019 Regular Council meeting minutes

2.00 INTRODUCTION OF Llate ITEMS

3.00 DELEGATIONS

1. Helen Boyd, Coordinator and Kaye Moynihan, Comox Valley Nurses for Health & the Environment and Comox Valley Nurses and Nurse Practitioners of BC - Request Ban on Single-use Plastic Bags

9 • Letters of Support - Ban Single-Use Plastic Bags
13 • Petition - Single-Use Plastics Ban

2. Patrick McKenna, Executive Director and Tom Beshr, Resource Development, Habitat for Humanity Vancouver Island North

25 • Letter to Mayor and Council
27 • Letter of Support from C. V. Coalition to End Homelessness

3. Don Castleden, Comox Valley Project Watershed Society - Estuary Management Plan Initiative and Funding Application to Vancouver Foundation

4.00 STAFF REPORTS/PRESENTATIONS

(a) Recreation and Cultural Services

29 1. Parks and Recreation Master Plan and Presentation, Catherine Berris, Urban Systems

(b) Development Services

35 2. Structural Change Application for Manufacturing Facility (Gladstone Brewing) 244 - 4th Street

39 3. Development Variance Permit for 3420 Rhys Road (The Ridge Phase 3B)

53 4. New Lounge Endorsement for Manufacturer Licence Application (Ace Brewing Company Limited) - 150 Mansfield Drive

(c) Financial Services

63 5. 2019 Grant-in-Aid Requests

75 6. 2019 - 2023 Municipal Solid Waste, Recyclables, and Yard Waste Budgets

5.00 EXTERNAL REPORTS AND CORRESPONDENCE FOR INFORMATION

6.00 INTERNAL REPORTS AND CORRESPONDENCE FOR INFORMATION

83 1. Briefing Note - 2019 Council Orientation Series - Capital Borrowing; Air Quality; LED Streetlights; and Speed and Safety Issues

7.00 REPORTS/UPDATES FROM COUNCIL MEMBERS INCLUDING REPORTS FROM COMMITTEES

- Councillor Cole-Hamilton
- Councillor Frisch
- Councillor Hillian
- Councillor McCollum
- Councillor Morin
- Councillor Theos
- Mayor Wells

8.00 RESOLUTIONS OF COUNCIL

1. In Camera Meeting

That notice is hereby given that a Special In-Camera meeting closed to the public will be held January 21st, 2019 at the conclusion of the Regular Council Meeting pursuant to the following sub-sections of the *Community Charter*:

- 90 (1) (c) labour relations or other employee relations;
- 90 (1) (i) the receipt of advice that is subject to solicitor-client privilege, including communications necessary for that purpose.
- 90 (1) (k) negotiations and related discussions respecting the proposed provision of a municipal service that are at their preliminary stages and that, in the view of the council, could reasonably be expected to harm the interests of the municipality if they were held in public.

2. Councillor Hillian Motion to Support Project Watershed's Estuary Management Plan Initiative

That the City of Courtenay supports Project Watershed's application for funding to establish an Estuary Management Plan in collaboration with K'omoks First Nation and other interested parties and to collaborate in the ongoing development of such a plan should Project Watershed's application be successful.

9.00 UNFINISHED BUSINESS

10.00 NOTICE OF MOTION

11.00 NEW BUSINESS

12.00 BYLAWS

For First and Second Reading

167 1. "City of Courtenay Fees and Charges Amendment Bylaw No. 2954, 2019"
(A bylaw to repeal Fees and Charges Bylaw No. 1673, 1992, Section III, Appendix IV "Garbage Collection Fees" and substitute with Section III, Appendix IV - "Solid Waste Collection Fees")

For Third Reading

167 1. "City of Courtenay Fees and Charges Amendment Bylaw No. 2954, 2019"
(A bylaw to repeal Fees and Charges Bylaw No. 1673, 1992, Section III, Appendix IV "Garbage Collection Fees" and substitute with Section III, Appendix IV - "Solid Waste Collection Fees)

171 2. "Zoning Amendment Bylaw No. 2930, 2018"
(A bylaw to allow for a secondary suite at 446 Qualicum Avenue)

For Final Adoption

171 1. "Zoning Amendment Bylaw No. 2930, 2018"
(A bylaw to allow for a secondary suite at 446 Qualicum Avenue)

13.00 ADJOURNMENT

NOTE: There is a Public Hearing scheduled for 5:00 p.m. in relation to:

Bylaw No. 2942 - Zoning Amendment to allow for a secondary suite (1435 Griffin Drive)

Minutes of a Regular Council Meeting held in the City Hall Council Chambers, Courtenay B.C., on Monday, January 07, 2019 at 4:00 p.m.

Attending:	
Mayor:	**B. Wells**
Councillors:	**W. Cole-Hamilton**
	D. Frisch
	D. Hillian
	M. McCollum
	W. Morin
	M. Theos
Staff:	**D. Allen, CAO**
	J. Ward, Director of Legislative and Corporate Services/Deputy CAO
	W. Sorichta, Manager of Legislative & Corporate Administrative Services
	I. Buck, Director of Development Services
	T. Kushner, Director of Public Works Services/Assistant CAO
	J. Nelson, Director of Financial Services
	D. Snider, Director of Recreation and Cultural Services
	A. Guillo, Manager of Communications

1.00 ADOPTION OF MINUTES

.01 MINUTES

Moved by Frisch and seconded by McCollum that the December 11th, 2018 Regular Council meeting minutes be adopted.
Carried

Moved by Frisch and seconded by Hillian that the December 17th, 2018 Committee of the Whole meeting minutes be adopted.
Carried

2.00 ADOPTION OF LATE ITEMS

3.00 DELEGATIONS

Bob Wright, made a presentation to Council regarding his application for a licence to occupy City owned property located at 431 - 2nd Street for vehicle access to his garage on the adjacent property. Mr. Wright requested Council's consideration to reject the proposed 5 year licence renewal and support Option 3 of the January 7th, 2019 staff report "B. and J. Wright 431 - 2nd Street Licence Agreement Request".

4.00 STAFF REPORTS/PRESENTATIONS

.01
B & J WRIGHT
431 - 2ND STREET
LICENCE
AGREEMENT
REQUEST
2240-20

Moved by Frisch and seconded by Theos that the January 7th, 2019 staff report, "B. and J. Wright 431 - 2nd Street Licence Agreement Request", be received for information.
Carried

Moved by Hillian and seconded by McCollum that based on the January 7th, 2019 staff report, "B. and J. Wright 431 - 2nd Street Licence Agreement Request", Council direct staff to draft a report investigating options and implications of implementing OPTION 3 to consider the Applicant's original request for a ten year licence agreement or renew the agreement for as long as the Applicant's residential buildings are erected on the Applicant's property; and include recommended contractual language.
Carried

.02
COMMUNITY CHILD
CARE PLANNING
PROGRAM INITIATIVE
5080-20

Moved by Frisch and seconded by McCollum that on the January 7th, 2019 staff report, "Community Child Care Planning Program Initiative", Council approve OPTION 1 and, subject to the Comox Valley Regional District (CVRD) leading as the primary applicant for the grant funding, direct staff to pursue funding through the Community Child Care Planning Program (CCCPP) as a partnering applicant; and

That staff collaborate with the CVRD on this project and support the CVRD to apply for, receive, and manage the grant funding on the City's behalf through a partnership agreement ensuring that the City's interests be represented in the study.
Carried

.03
STRUCTURAL
CHANGE
APPLICATION FOR
MANUFACTURING
FACILITY
(GLADSTONE
BREWING) 244 - 4TH
STREET
4320-20

Moved by Frisch and seconded by Theos that based on the January 7th, 2019 staff report, "Structural Change Application for Manufacturing Facility (Gladstone Brewing) - 244 - 4th Street", Council approve OPTION 1 and direct staff to post notice on the City's website requesting public input on their structural change application for Council consideration at the regular meeting scheduled for January 21st, 2019.
Carried

.04
NEW LOUNGE ENDORSEMENT FOR LIQUOR MANUFACTURER LICENCE APPLICATION (ACE BREWING COMPANY LIMITED) - 150 MANSFIELD DRIVE
4320-20

Moved by McCollum and seconded by Frisch that based on the January 7th, 2019 staff report, 'New Lounge Endorsement for Liquor Manufacturer Licence Application (Ace Brewing Company Limited) - 150 Mansfield Drive', Council approve OPTION 1 and direct staff to post notice on the City`s website requesting public input on their new liquor primary licence application for Council consideration at the regular meeting scheduled for January 21st, 2019.
Carried

.05
ZONING AMENDMENT BYLAW NO. 2942 TO ALLOW FOR A SECONDARY SUITE AT 1435 GRIFFIN DRIVE
3360-20 / 1715-20

Moved by Frisch and seconded by Morin that based on the January 7th, 2019 Staff report, "Zoning Amendment Bylaw No. 2942 to allow for a secondary suite at 1435 Griffin Drive" Council approve OPTION 1 and proceed to First and Second Readings of Zoning Amendment Bylaw No. 2942, 2019; and,

That Council direct staff to schedule and advertise a statutory public hearing with respect to Zoning Amendment Bylaw No. 2942, 2019 on January 21st, 2019 at 5:00 p.m. in the City Hall Council Chambers.
Carried

5.00 EXTERNAL REPORTS AND CORRESPONDENCE FOR INFORMATION

6.00 INTERNAL REPORTS AND CORRESPONDENCE FOR INFORMATION

.01
ROUTINE RELEASE OF IN CAMERA RESOLUTIONS JAN - DEC 2018
0570-05

Moved by Hillian and seconded by Frisch that the In Camera Resolutions for the period of January to December 2018 be received for information.
Carried

7.00 REPORTS/UPDATES FROM COUNCIL MEMBERS INCLUDING REPORTS FROM COMMITTEES

COUNCILLOR COLE-HAMILTON

Councillor Cole-Hamilton reviewed his attendance at the following events:

- City of Courtenay Christmas celebration

COUNCILLOR HILLIAN

Councillor Hillian reviewed his attendance at the following events:

- CVRD Board meeting
- CVRD Strategic Planning meeting
- CVRD facilities tour
- Comox Valley Community Justice Centre Board meeting

Councillor Hillian acknowledged the passing of one of Courtenay's long standing City Councillors, Judith Harder, and expressed condolences to the Harder family and friends on behalf of Council and staff

COUNCILLOR MCCOLLUM

Councillor McCollum reviewed her attendance at the following events:

- CVRD facilities tour
- City of Courtenay Christmas celebration

COUNCILLOR MORIN

Councillor Morin reviewed her attendance at the following events:

- Habitat for Humanity - Habitat Key Ceremony, 1330 Lake Trail Road
- City of Courtenay Christmas celebration
- CVRD facilities tour
- Morrison Creek Headwaters tour hosted by Project Watershed

COUNCILLOR THEOS

Councillor Theos reviewed his attendance at the following events:

- July 1st Committee meeting

MAYOR WELLS

Mayor Wells reviewed his attendance at the following events:

- CVRD Board Meeting
- CVRD Strategic Planning Session
- Delivered Hot Turkey Meals to those in need
- Attended CFB Comox Wing Commanders Levee event
- Met with Howie Siemens, Emergency Program Coordinator, CVRD to review emergency protocol
- Attended Richard Hallett's celebration of life
- Met with Inspector Mike Kurvers, Comox Valley RCMP

The council meeting recessed at 4:57 p.m. for the Public Hearing regarding Bylaw No. 2930. The meeting reconvened at 5:13 p.m.

8.00 RESOLUTIONS OF COUNCIL

.01
IN CAMERA MEETING

Moved by Frisch and seconded by Morin that a Special In-Camera meeting closed to the public will be held January 7th, 2019 at the conclusion of the Regular Council Meeting pursuant to the following sub-sections of the *Community Charter*:

- 90 (1) (c) labour relations or other employee relations;
- 90 (1) (i) the receipt of advice that is subject to solicitor-client privilege, including communications necessary for that purpose.

Carried

9.00 UNFINISHED BUSINESS

.01
DELEGATION REQUEST
BRUCE GIBBONS, MERVILLE WATER GUARDIANS

Councillor Hillian requested that the three aspects of the delegation request made by Bruce Gibbons, Merville Water Guardians, be considered separately and each item be voted on individually by Council; *Council Procedure Bylaw No. 2730 Section 27 (5).*

1. Consider implementing a bylaw that prohibits water bottling in any of the City's zoning.

   Moved by Hillian and seconded by Frisch that Council direct staff to prepare a bylaw to amend Zoning Bylaw 2500, 2007 to remove water bottling as a permitted use in all zones; and

   That Council direct staff to prepare a report regarding the proposed bylaw and invite any impacted parties to attend Council to discuss the bylaw.
   Carried

2. Support the Strathcona Regional District resolution to ask the Provincial Government to curtail the commercial extraction of groundwater resources for bottling or bulk water sales.

   Moved by Hillian and seconded by Frisch that Council Support the Strathcona Regional District resolution to ask the Provincial Government to curtail the commercial extraction of groundwater resources for bottling or bulk water sales.
   Carried

3. Pass resolutions that would achieve designation by the Council of Canadians as a Blue Community, by adopting a water commons framework that
   a) Recognizes water as a human right
   b) Promoting publicly financed, owned and operated water and waste-water services
   c) Bans the sale of bottled water in public facilities and at City events.

   Moved by Hillian and seconded by Frisch that Council direct staff to provide a report on the implications of banning the sale of bottled water in public facilities and City events.
   Carried

.02
DELEGATION REQUEST
MAURITA PRATO, LUSH VALLEY FOOD ACTION SOCIETY
LEASE RENEWAL AND BUDGET

Moved by Frisch and seconded by McCollum that Council direct staff to investigate cost and implications related to the request received from Maurita Prato, LUSH Valley Food Action Society, for Council's support, as identified in their November 19, 2018 delegation presentation for lease renewal and funding.
Carried

.03
DELEGATION REQUEST
COMOX VALLEY COALITION TO END HOMELESSNESS

Moved by Hillian and seconded by McCollum that Council approve a one-time only grant of $35,000 to the Comox Valley Coalition to End Homelessness to increase their current Coordinator position from part-time to full-time for the development and implementation of a coordinated community response to homelessness; and,

that the $35,000 in funding comes from gaming funds revenue.
Carried

Amending Motion

Moved by Frisch and seconded by McCollum that Council include a written request to the Town of Comox, Village of Cumberland and area Directors of the Comox Valley Regional District to support the City of Courtenay in funding the original amount of $35,000 requested by the Comox Valley Coalition to End Homelessness to increase their Coordinator position to full-time.
Carried
The main motion was carried as amended.

10.00 NOTICE OF MOTION

11.00 NEW BUSINESS

12.00 BYLAWS

.01
BYLAW NO. 2942, 2019
ZONING AMENDMENT TO ALLOW FOR A SECONDARY SUITE
1435 GRIFFIN DRIVE

Moved by Frisch and seconded by Cole-Hamilton that "Zoning Amendment Bylaw No. 2942, 2019" pass first and second reading.
Carried

.02
BYLAW NO. 2948, 2018
ZONING AMENDMENT (PERMIT DAYCARE AND FAMILY DEVELOPMENT CENTRE USE)
1625 & 1679 MCPHEE AVENUE

Moved by Hillian and seconded Frisch by that "Zoning Amendment Bylaw No. 2948, 2018" pass third reading.
Carried

Moved by Hillian and seconded by Frisch that "Zoning Amendment Bylaw No. 2948, 2018" be finally adopted.
Carried

13.00 ADJOURNMENT

.01 Moved by Frisch and seconded by Theos that the meeting now adjourn at 6:03 p.m.
Carried

CERTIFIED CORRECT

_____
Corporate Officer

Adopted this 21st day of January, 2019

_____
Mayor

December 14, 2018

Attention: Mayor Bob Wells & Councillors

Courtenay City Hall,
830 Cliffe Avenue,
Courtenay, B.C. V9N 2J7

Via: mailto:info@courtenay.ca

Dear Mayor and Councillors,

As we welcome you as our new council, the **Comox Valley Council of Canadians**, enthusiastically lend our collective support to the **Comox Valley Nurses for Health and the Environment & Comox Valley Chapter of Nurses and Nurse Practitioners of BC**, in their appeal to the City of Courtenay to ban single-use plastic bags at the point of sale as part of an effort both to reduce plastic pollution in the Comox Valley and to promote awareness of, and a conversation around, what is now a major international problem.

As you may know, a large body of scientific knowledge informs us of the impact of single-use plastic on our water systems and the environment. Single-use bags are an ecological danger because they degrade into microplastics and further leach into soils, groundwater, and the ocean. Plastics are commonly found in and on Vancouver Island's rivers, lakes and beaches, frequently harming marine wildlife and entering our food webs.

Note additionally, that at the Union of BC Municipalities annual conference in Whistler, 'the single-use plastics resolution was unanimously supported by convention delegates asking the province to work with local governments and retailers to introduce "uniform province-wide business regulations in relation to disposable plastic packaging. Once adopted, this would substantially reduce the volume of disposable plastic packaging in local solid waste streams" (Times Colonist, Sept 13, 2018).

Locally, Cumberland has taken the first steps in this direction, when council voted to introduce the ban in a phased approach, starting with plastic grocery bags and straws, with enforceable bylaws going into effect July 2019.

During the run up to the election, we were very pleased to see a majority of the candidates for council in Courtenay state their support for a ban on plastic bags. We now join the above organizations, along with a broad base of local organizations, businesses, and citizens to call on the Town of Comox to follow through and enact a ban on single use plastics in the Town of Comox.

We look forward to your support in enacting the appropriate bylaws to safeguard our environment for generations to come.

Regards,

Comox Valley Council of Canadians

December 8th, 2018

Attention: City of Courtenay
Mayor & Council

Dear Mayor Bob Wells and Councillors,

The following is a letter of support from the Sustainability Action Group for the Environment (SAGE) for the initiative of the Comox Valley Nurses for Health & Environment and Nurses and Nurse Practitioners of BC who are spearheading a local campaign to **ban the use of single-use plastic bags at point of sale throughout the Comox Valley**.

As an active group in our community which seeks to bring awareness to a variety of Sustainability issues, we had the pleasure of hosting last spring a talk by a Marine Biologist who underscored the growing negative impact of microplastics in our food web. A major step to remediate this pressing problem would be to tackle the source of such plastic pollution and to see a Ban on Single-use Plastic bags as an initial step forward.

We are aware of many communities of Vancouver Island pursuing this same objective. The City of Victoria has been successful in upholding the implementation of this Bylaw despite a challenge in the Supreme Court of BC by the plastic industry. Locally, the Village of Cumberland has taken bold steps in a similar direction with the draft of a preliminary bylaw that outlines a clear path to emulate for a Comox Valley wide ban.

We urge the City of Courtenay to show their commitment to our Environment and to issues of Sustainability that preserve the beauty of our coastlines, the health of citizens and the biodiversity of our oceans by supporting the proposed ban.

Sincerely,

Sustainability Action Group for the Environment

January 14, 2019

Global Learning Initiative
North Island College
2300 RYAN RD, COURTENAY, BC, V9N 8N6

Dear Council Members of Courtenay, Comox and Cumberland,

The Global Learning Initiative (GLI) of North Island College supports the proposed by-law to ban single use plastic bags at the 'point of sale' in Comox, Courtney and Cumberland, British Columbia. The GLI is led by Bachelor of Science in Nursing program students in partnership with faculty and local, indigenous, and international community groups. The goal of GLI is to foster awareness about local and global health and environmental issues and participate in the creation of a healthier, happier world. To do this our organization hosts speakers and shares films at the college.

This year GLI has adopted an environmental preservation theme. One of the issues we chose to focus on is reducing use of plastic. To engage the community, we have shown the film 'Bag It'. This film highlights the enormous issue of the overuse of plastic and the impact it has on health and the environment. Helen Boyd, a representative of Comox Valley Nurses for Health and the Environment led a conversation and question and answer session following the film. It is through Helen that GLI came to know about the proposition to create the by-law to ban single use plastics bags at the point of sale in Comox, Courtenay and Cumberland.

The ban of single use plastic bags at the point of sale in these communities would be tremendously beneficial for the health of our environment, the oceans, and the human population, as the health of humanity and the health of the earth are inextricably linked. By choosing to take this step toward a positive future, Comox, Courtenay, and Cumberland will join other progressive villages, cities and nations across the world to counter environmental devastation and pollution.

The GLI is in full support of the creation of a by-law which bans single use plastic bags at point of sale in Comox, Courtenay and Cumberland. Thank you for your time and interest in this matter. If you have any questions please contact GLI using the emails below.

Sincerely,

Kate Moynihan 3rd year NIC BSN Student kmoynihan@northislandcollege.ca
Lydia Hardy 3rd year NIC BSN Student lhardy@northislandcollege.ca
Meghan Leahy 3rd year NIC BSN Student mleahy@northislandcollege.ca

PETITION OF SUPPORT

For a Comox Valley Wide Ban on Single Use Plastic Bags Bylaw

Dear Mayors, Councillors and Regional Directors of the Comox Valley,

Plastic bags are known to have a negative impact on our oceans and sensitive waterways. The average Canadian uses up to 200 bags per year. The bags are often made of petroleum products that require extraction of resources. Plastic bags are often used only once and discarded which becomes litter or waste that burdens our landfill management services.

For these stated reasons, and as a resident of the Comox Valley, I, the undersigned, am in support of a bylaw to ban the use of single use plastic bags at point of sale throughout the Comox Valley.

Name	Address and Postal Code	E-mail
1. Helen Boyd	1659 Beaufort Ave Comox V9M 1R8	CVCNHE@telus.net
2. Ross Griffith Cochrane	1882 Swinging Sands Rd. Comox V9N 3x9	rgriffco@yahoo.ca
3. Margaret Griffith Cochran	" " " "	mgriffco@gmail.com
4. Verna Ardron	641 Moralee Dr Comox V9M 1T5	
5. [illegible]	265 Glacier View Dr. Comox	christyfae gmail.com
6. ELAINE KERR	403 DENMAN ST. COMOX	EKERR.ART@GMAIL.COM
7. Bob Crown	1435 12th St East	rjcrown@telus.net
8. MARC GAUDREAU	6540 COUNTRY RD F.B.M	
9. D. BRAULT	1503 JUNIPER PL, COMOX V9M 1A2	1952GIRL@gmail.com
10. B. CASSACK	2875 ROYAL VISTA WAY, COURTENAY V9N 8R6	jackbarb@telus.net
11. R Oliver	1719 Robb Ave, Comox, BC	
12. C OLIVER	4017 FRASER RD COURT.	
13. D Scholefield	537 Walter Rd. Comox	
14. Gail Hegham	296 Gladstone St., Comox V9M 1X5	~~[illegible]~~@gmail.com
15. M. BIRRES	2194 Noel AVE Comox	paws-n-hoofs@hotmail.com
16. J. VanOostdam	1740 Linden Ave, Comox V9M 2L4	jvanoostdam@yahoo.com
17. CARL GRAVES	1659 BEAUFORT AVE, COMOX V9M 1R8	bgrave4@me.com
18. James Taylor	1021 Kingsley Cres. Comox	jtaylor.1021@gmail.com
19. Jim Jeske	737 Lancaster Way Comox	jeskejim1945@gmail.com
20. R. GILES	#4, 1600 Balmoral, Comox	R. & H. M. Giles giles8@shaw.ca

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Name	Address and Postal Code	E-mail
1. Brenda Cuggy	178 Back Rd Courtenay B V9N 3W6	brendacuggy@gmail.com
2. Sara Sandkuhl	4645 McQuillan Rd Courtenay	sara-sandkuhl@gmail.com
3. Tree Murdock	2440 Rosewall Cres Courtenay	treeislandcyc@yahoo.com.au
4. Leah Johns	2123 Plover Court Comox	leah.michaud@hotmail.ca
5. Maria Harkies	2224 Chestnut Ave Comox V9M 1H6	pro_soccer16@hotmail.com
6. Kelly Blacquiere	2295 Strathcona Cres Comox V9M 1K2	Kellypenney@gmail.com
7. Derek Valentino	1090 Farquharson Drive Courtenay	[illegible]
8. Danyka Kozlowski	3420 Stoneridge Ave Courtenay V9N 0B3	danykakozlowski@hotmail.com
9. Jessica Hiebert	791 Timberlane Rd V9N 9K9	jesshiebert@icloud.com
10. Karla van der Griendt	2980 Country Close CR BC V9W 6Y6	karla_wray@hotmail.com
11. Sheldon Revoy	470 Cormorant Road V9W 5Z6	srevoy@northislandcollege.ca
12. Natasha Love	473 Murray Place Campbell River V9W 6S2	nlove@northislandcollege.ca
13. HILARY CHAPMAN	101-130 BACK RD, COURTENAY V9N 3W6	h.primmett@hotmail.com
14. Jennifer Stahley	4066 Bruce Ave Port Alberni V9Y 3J9	jenniferstahley@hotmail.com
15. Ariane Jensen	653 Old Petersen Road Campbell River, BC V9W 3N1	ajensen@northislandcollege.ca
16. Sarah Higgins	103-1355 Cumberland Rd Courtenay V9N 2G1	sarahhigg@hotmail.com
17. Alexandra Timms	3391 Solport St. Cumberland V0R 1S0	alexandra.timms_xo@hotmail.com
18. Nikki Irlam	4-4110 Kendall Ave. Port Alberni V9Y 5J7	nicole.irlam@nic.bc.ca
19. Wanisa Sukree	3661 Maitland St. Port Alberni BC V9Y 3X5	wsukree@northislandcollege.ca
20. Lynne Oberik	1882 Waveland Rd Comox V9M 4E5	doberik@nic.bc.ca

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For a Comox Valley Wide Ban on Single Use Plastic Bags Bylaw

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Sincerely,

Name (Please Print)	Address and Postal Code	E-mail
1. NIC GLAZNER	2946 Suffield Rd. V9N 3V5	nicglaze@hotmail.com
2. Rebecca Rowe	874 Knight Rd V9M 3T2	rebecca.rowe@outlook.ca
3. Maya Fleming	1315 Pheasant Pl., V9H 8H2	maya.fleming@shaw.ca
4. Hilary Chapman	101-130 Back Rd, Courtenay, V9N 3W6	h.pimmett@hotmail.com
5. Kira Marshall	3644 Vermont Pl. /CR. V9H1V3	kiramarshall@hotmail.com
6. Janine Branchi	1048 5th Street/court. V9N 1L4	janinebranchi14@gmail.com
7. Antonia Tharandt	Hessestrasse 8, 90443 Nuremberg, Germany	antonia-tharandt@web.de
8. Stephanie Joy Jubas	1575 A 1st. Street, Courtenay, V9N 1B4	scj1997@gmail.com
9. Anna Branchi	677 Tern Pl Campbell River BC	abranchi@icloud.com
10. Logan OBrien	714 11th Street Courtenay V9N1T2	
11. Molly Varrow	714 11th Street Courtenay V9N1T2	molly.alesia@hotmail.com
12. Jenn Morgan	1461 Thimbleberry Cres V9R 2K8	jennahfur@hotmail.com
13. Haley Isles	4104 Glartley Point Rd V9N 9T2 Courtenay	haleyisles@gmail.com
14. Mady Demers	2456 Dakota Pl Comox V9M 4B5	madydemers@gmail.com
15. Richard Anderson	5975 Cathedral Crescent Nanaimo V9T 6B1	Richyfish001@gmail.com
16. Heidi Deagle	604 Pritchard Rd. Comox BC V9N 3S9	
17. Michelle Schaefer	1832 Queens Ave Comox	mischkuau@yahoo.com.au
18. Alana Macintosh	370B Forester Ave Comox	alanamacintosh_737@hotmail
19. Dave Kaster	618 Aspen Rd Comox.	dcfras888@gmail.com
20. CATHIE TALBOT	392 CURTIS RD, Comox	Cgtalbot@shaw.ca
21. Peter Paulson	476 Curtis Rd Comox	Paulsonswestcoutlook.ca
22. Joanne Paulson	" " "	paulsonswest@shaw.ca
23. Nicole Minions	385 Sable Place, Comox V9M 2E2	nicoleminions@gmail.com
24. JANET FAIRBANKS	6929 RAILWAY AVE, CTNY V9J 1N4	Janet fairbanks bradley@gmail.com
25. Steve Faraher Amidon	265 Glacier View Comox V9M 1G6	

PETITION OF SUPPORT
For a Comox Valley Wide Ban on Single Use Plastic Bags Bylaw

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Sincerely,

Name (Please Print)	Address and Postal Code	E-mail
1. Jan Meiers	210-2767 Muir Rd	jmeiers@nicbc.ca
2. Sarah Vallintine	24408 First St	sarahvallintine@gmail.com
3. Fiona Curry	5937 Aldergrove Dr. Courtenay	fmmcurry@gmail.com
4. Mariellе Tattman	203-1692 Alderwood Pl. V9N 9A1	mtattman@gmail.com
5. Jessica Blundell	6520 Rennie Rd	jessica.jj.blundell@gmail.com
6. Brooke McWilliams	2952 B Upton Rd, Courtenay V9N3V3	beetle-mc@hotmail.com
7. Karla Blain	2266 5th St. East V9N 8Y2	goldens1250@gmail.com
8. Keisha Henry	2803 Piercy Avenue V9N 6X9	keisha-marie2009@yahoo.ca
9. Mary Pat Wiley	#24-1755 Wildemar Ave	
10. Risa Branchi	~~1048~~ 1048 5th Ave V9N 1G4	
11. Sarah Higgins	103-1355 Cumberland Rd, Courtenay V9N 2G1	sarahhigg@hotmail.com
12. Sarah Switzer	103/4705 Alderwood Pl.	sarahssucculents@gmail.ca
13. TIA SCHEFFER	884 Salsbury Rd V9N 9M3	crschaffer@gmail.com
14. JOEY LORANGER	105A 178 BACK RD V9N 3W6	jloranger87@gmail.com
15. ALYSSA LEFORT	513 BUTCHERS RD V9M 4A3	lefortalyssa@gmail.com
16. Josh Duncan	4254 Miromar Road V9N 9N1	joshduncan13@hotmail.com
17. Alex Bissinger	1999 Robb Ave Comox BC V9M3E3	alexandrabissinger@gmail.com
18. Barb Hardy	7779 Is. Hwy Black Creek V9J1G8	barbie60@hotmail.ca
19. Molly Hardy	7779 IS. Hwy Blackcreek V9J1G8	
20. Kate Moynihan	3311 welch rd. Qualicum	kmoynihan@live.com
21. Eve Gaudreau	6590 Country Road V0R1W0	evegaud@telus.net
22. WENDY PROTHERO	1945 Beaufort Ave. Comox V9M 1S4	geower@telus.net
23. Kevin Travland	Box 342 Merville BC V0R2M0	
24. Henning Larsen	3928 Ronalt Ave, Royston BC V0R2V0	henningandlauri@gmail.com
25. Tony + Margaret Powsey	2849 Penrith Ave Cumberland V0R1S0	

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Name	Address and Postal Code	E-mail
1. Jesslyn Bradbury	10 Sylvan cres. Parksville BC V9P 1H1	Jesslynbradbury@gmail.com
2. Julie Kitchener	1920A Noort Place Courtenay BC V9N 8Y5	ejkitchener@northislandcollege.ca
3. Jamie Spencer	7452 Cougar Smith Rd. Courtenay BC V0R 1W0	jyspencer@hotmail.ca
4. Jenna Everson	2259 Strathcona Cres Comox, V9M 1K7	jennaeverson@outlook.com
5. Madisen Forbes	4405 9th ave Port Alberni V9Y 4W4	madiforbes@hotmail.com
6. Teryn Bates	2170 Sussex Drive V9N 0E3	terynbates97@gmail.com
7. Mary Parker	3949 Livingstone Road. Royston. V0R 2V0	maryparker.97@hotmail.com
8. Carlee Marshall	4937 Gordon rd. Campbell River V9H 1N8	carleerae-10@hotmail.com
9. Eric Gill	2167 Cardinal Place Comox, 395362	giller96@outlook.com
10. Brianna Mowatt	4414 9th Ave Port Alberni BC V9Y 4V5	bmowatt@northislandcollege.ca
11. Leslie Wynne	2701 Penrith ave Courtenay	leslie.ellen.wynne@gmail.com
12. Natasha Farrant	1320 Creekside Way, CR. V9W 8A9	natashafarrant@gmail.com
13. Lenya Hendriks	1603 B Burgess Rd. Courtenay	lhendriks@northislandcollege.ca
14. Kelsey Byers	2615 Mabley Rd Courtenay BC	Kels.byers87@gmail.com
15. Sarah Rayan	2703 Shetland Rd	Sarahjacquliner@gmail.com
16. Dana H. Tennant	1693 Mahtmof Place	dana_10ant@hotmail.com
17. Melissa Aydon	544 Macplace CR BC V9W 6L6	maydon@northislandcollege.ca
18. Emma Hill	2891 Rusland Rd, Cumberland V0R 1S0	emma.1364@hotmail.com
19. Stephanie Dubas	1575 A 1st. Streets, Courtenay, BC, V9N 1B4	sdy1197@gmail.com
20. Deanna Doucette	2167 Cardinal Place, Courtenay Comox	deanna-doucette@hotmail.com

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Name	Address and Postal Code	E-mail
1. Lonney Richards	Box 23 Union Bay BC V0R3B0	lrichards@northisland
2. Michelle Nobbe	2713 Kendal Ave Cumberland V0R 1S0	michelle.nobbe78@gmail.com
3. Carla Wagner	2560 5th Ave Port Alberni	Cutieklatt@gmail.com
4. Zoë Bourke	755 Hobson Ave Courtenay V9N8C6	zbourke@northislandcollege.ca.
5. Sarah Meaney	V9W2T6 CR	sarahmmeaney@
6. Kim Walker	PO box 911 2799 derwent ave cumberland V0R1S0	kmathieu@live.com
7. Danielle Gibbons	1400 Kye bay rd	lGibbons@hotmail.com
8. Madison Hemingway	2025 Partridge Place, Courtenay BC V9N8M4	madison.hemingway@gmail.com
9. Laura Firth	1521 Tull Ave Courtenay BC	lairth84@hotmail.com
10. Maria Einarson	501 Southwind Rd Comox V9M3T9	maria.einarson@hotmail.com
11. CARA ROULSTON	1411 FISHER ROAD CORBLE HILL BC. V0R 1L2	CARA.ROULSTON@YAHOO.CA
12. Meghan Leahy	389 Denman St. Comox BC. V9M 3A7	mkmoleahy@gmail.com
13. Jaymee Peternel	2781 Mary Port Ave Cumberland BC V0R1S0	jaymee.peternel@hotmail.co
14. Katrina Girard	884 Sand Pines Crescent	katrinagirard@hotmail.com
15. [illegible]	1731 [illegible]	[illegible]
16. Lynne Park	10-717 Aspen Rd Comox V9M 3X4	chaelynne park @gmail.com
17. Sherri Bentsen	512 Lilac Place CR V9W 7G6	sheribentsen@gmail.com
18. Kate Moynathan	3311 welch rd. Qualicum beach	kmoynathan@live.com
19. Rhylie Lee	3500 Haskam Lane	rhylie.lee@hotmail.com
20. Lumi van Grootheest	3369 2nd St. Cumberland V0R 1S0	ivangrootheest@northislandcollege.c

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Name	Address and Postal Code	E-mail
1. Andrew Chapman	101-130 Back Rd V9N 3W6	
2. Genoa Horsthuis	8408 North Isl. Hwy Black Creek V9J 1H2	
3. Carley Babb	303-5255 Dogwood, Campbell	
4. Carrie Gage	351 Thulin St, Campbell River	
5. Sabrina Bosch	2604/B Kendal Ave Cumberland	
6. Kyra Olsen	4083 Chancellor cres. V9N 0B3	kyraolsen@hotmail.com
7. Sandra Hervieux	507 Deerwood Place Comox, BC V9M 4G3	sandra.hervieux@hotmail.com
8. DRUE WELLER	4220 ENQUISTRO CAMPBELL RIVER	druewellen@hotmail.com.
9. Mike woywitka	5823 brier St, Duncan BC V9L3E	Mikeywoy@gmail.com
10. Rupert Love	506 Thulin St, Campbell River V9W 2K1	rlove@northislandcollege.
11. Elizabeth Finch	651 Colwyn St, Campbell River V9W 2X2	efinch6@gmail.com
12. Katie Gabany	115516th St, Courtenay, V9N 1Y1	kaithyn-gabany@hotmail.com
13. Natalie Stevens	2807 Denman St Campbell River V9H 1S9	natalie.stevenss@outlook.com
14. Andrea Schmidt	1945 Galeno Rd Campbell River V9W 1K8	andreaschmidt_2@hotmail.com
15. Rebecca Dunn	unit 3-1606 South Island Hwy V9W 1B7	rdunncrd@gmail.com
16. Deva Braaten	6 of orchard park drive Comox BC V9M 2S4	devabraaten@gmail.com
17. Vanessa Lamb Knox	736 Onbi Drive, Campbell River BC, V9W 8B3	vanessa.lambknox@mail.mcgill.ca
18. John A. Hutchins	570 Rockland Rd, Campbell River BC, V9W 6T5	jahutchins@northislandcollege.ca
19. Karli Buchanan	755 Hobson Ave, Courtenay BC, V9N 8C2	karlibuchanan@hotmail.com
20. Nicolle Simon	1309 Noel Ave, Comox BC V9M 3S7	nsimon@northislandcollege.

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Name	Address and Postal Code	E-mail
1. Liz McKay	2790 7th AVE PORT Alberni, BC V9Y 2S7	
2. Monica Swanson	6332 Trevere Rd. Courtenay BC V9J 1V5	monica.swanson@xerox.ca
3. Tamara Robertson	1505 Juniper Dr, CR BC V9W 7H2	t_hink@live.ca.
4. Jennifer Hoffman	2760 12th Ave. Port Alberni V9Y 2E9	jhoffman294@gmail.com
5. Shaylene McRae	3531 32nd Ave, Port Alberni, V9Y 7M4	smcrae1@northislandcollege.ca
6. Kyle Scott	3617 Dove Cr Rd Courtenay	Kyle.scott.care@gmail.com
7. Emma Paul	280B Nim Nim Pl Courtenay, BC V9N 8S5	epaul1@northislandcollege.ca
8. Sam Desroches	14-717 Aspen Rd Comox BC V9M 3X4	
9. Ryan Parton	2440 B First St. Courtenay BC V9N 8X9	ryan@ripcopywriting.com
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Sincerely,

Name (Please Print)	Address and Postal Code	E-mail
1. Meghan Leahy	389 Denman St. Comox V9M 3A7	mkmoleahy@gmail.com
2. Annette Moulaison-Davis	2923 Muir Rd Courtenay	davis-5@shaw.ca
3. Barbara Mayol	2906 Cascara Cres. Courtenay	
4. Taylor Duck	4656 Mclauchlin ave Courtenay	duck2357@icloud.com
5. Emma Oddleifson	4871 Greaves Cres V9J 1R5	emma.oddleifson@gmail.com
6. Madison Hemingway	2025 Partridge Pl Courtenay V9N 8H4	madison.hemingway@gmail.com
7. Dana Tennant	1693 Mahtmof Pl. V9M 2L9	dana_10ant@hotmail.com
8. Kathy Tennant	"	
9. Jessica Nixon	6126 Island hwy Courtenay V9J 1T5	jessicalynnixon@gmail.com
10. Allison Benashek	E-426 Anderton Ave Courtenay V9N 2C8	ambenashek@gmail.com
11. Benedict Leonard	7636 Bell Rd Port Alberni V9Y 9E6	benleonard@hotmail.com
12. PATRICIA FOSTER	1050 2ND ST COURTENAY V9N 1C4	patricia.foster365@gmail.com
13. Jade Laurey	2024 Black Creek Rd V0R 1C0	judylynnjauzen@gmail.com
14. Trish Sarvido	3773 Dohm Road Black Creek	sarvidot@telus.net
15. Tara Jantzen	244 Aitken st. Comox V9M 1P1	t-myjantzen7@hotmail.com
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Sincerely,

Name (Please Print)	Address and Postal Code	E-mail
1. JANET GOODACRE	471 WINDSLOW Rd V9N 3T4	
2. Frank Price	24 Zenka pl. Comox BC	
3. Rhonda Scrivin	1900 ST. ANDREWS PL. CITY	
4. Karina Thygesen	3617 Dove Creek Rd Courtenay V9J 1P3	
5. Joel Thygesen	3617 Dove Creek Rd Courtenay V9J 1P3	
6. Trevor Fox	3-1275 Guthrie Rd Comox V9M 4E6	
7. Heather McLean	2055 East Rd, Denman Isl V0R 1T0	
8. Margaret Carl	4746 Kilmarnock V9N 9S4	
9. NINA HAAVE	901-2202 LAMBERT DR, V9N 1Z8	
10. Arlene Bell	8-1720 Guthrie Rd V9M 4H6	
11. Celia Laval	156A Malcolm, Courtenay V9N 8X8	
12. Ruby Vic	156A Malcolm pl, Courtenay V9N 8X8	
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Name	Address and Postal Code	E-mail
1. Amber Hunter	3695 Carstairs Dr.	amberhunter19@gmail.com
2. Devan Cooper	9711 Rydal Ave V0R 1S0	devan.k.cooper@gmail
3. Sam Desroches	717 Aspen Rd V9M 3X4	sdesroches@northislandcollege.ca
4. Monica Swanson		monica.swanson@nic.bc.ca
5. Melody Richardson	2515 Anderson Ave Port Alberni	melody.cbba@gmail.com
6. Nicole Hofer	Unit B 2884 Kendal Ave Cumberland	nhofer@northislandcollege
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Habitat for Humanity® Vancouver Island North

We build strength, stability, self-reliance and shelter.

City of Courtenay
830 Cliffe Avenue
Courtenay, BC
V9N 2J7

Honorable Mayor and Council, January 3 , 2019

First let me congratulate you all on your election results. As I am finding out, public service is truly an experiential firehose. Amongst all your other tools I commend you on your research skills and patience.

Friday December 14, 2018 Habitat celebrated the Key ceremony and dedication of it's, "12th and 13th families served," in Courtenay and with eight more homes to be built in the next two years on Lake Trail Road, we are eagerly anticipating our next build project in the Comox Valley The current build on 1330 Lake Trail Road will invest over 2.2 million dollars into the economy of Courtenay. It will give an overall "Hand Up" to 10 Courtenay families, moving these families from income assistance, and low cost rental housing to safety, strength and independence through home ownership.

Thank you so much for your tremendous past support of Habitat for Humanity. Today, we look toward the future. Habitat is searching for more land in Courtenay but the opportunities are slim. Today our ask is simple but complex as we know there are many in need of the same thing. With the support of the Comox Valley Coalition to end Homelessness, we are here today to ask for a donation, or a reduced price purchase, of any City owned surplus lands to allow Habitat to keep building. A serviced, multi family zoned lot between .25 and 1 acre is the desired ask as it allows us the most flexibility to serve our families faster. Of course, we are open to all considerations.

Thank you once again for your generous support of our programs and we look forward to a continued partnership in eradicating homelessness and increasing the affordable housing options to the citizens of Courtenay.

Sincerely

Patrick McKenna

Patrick McKenna
Executive Director
Habitat for Humanity Vancouver Island North

Affiliate Office | 1755 13th Street, Courtenay, BC V9N 7B6 tel (250) 334-3777 fax (250) 334-2528 info@habitatnorthisland.com HabitatNorthIsland.com
Campbell River ReStore | 1725B Willow Street, Campbell River, BC V9W 3M8 tel (250) 830-1493 restorecr@habitatnorthisland.com
Comox Valley ReStore | 1755 13th Street, Courtenay, BC V9N 7B6 tel (250) 334-3784 restorecv@habitatnorthisland.com

Comox Valley Coalition
TO END HOMELESSNESS

December 19, 2018

RE: Habitat for Humanity Vancouver Island North's request for land

To Whom It May Concern,

The Comox Valley Coalition to End Homelessness (the Coalition) is writing this letter in support of Habitat for Humanity Vancouver Island North's request for suitable land to build homes based on their model of affordable home ownership. The Coalition works as a collective to plan, coordinate, recommend and implement community responses to homelessness. The Coalition's shared objectives and commitments are to actively support and promote initiatives such as Habitat for Humanity.

The Coalition advocates for a continuum of housing needs from shelters, supportive/transitional housing, all the way to affordable rentals, and home ownership. Habitat for Humanity meets an affordable housing gap in our community through their unique model of affordable home ownership which helps local families build strength, stability, and independence. Habitat for Humanity also has a proven track record in our community and successfully brings together members of the community including intended future home-owners, community groups, non profit agencies, business owners, faith organizations and municipal government to build much needed homes. We are pleased and proud to have Habitat for Humanity as an esteemed member agency of the Coalition and the current and future homes they build are part of our five year plan.

The Coalition has identified the lack of available land as one of the major challenges to providing safe, affordable housing. We believe that municipalities can help by identifying and/or creating a land bank of municipal-owned, appropriately zoned land that can be allotted towards affordable housing initiatives such as Habitat for Humanity's plans to build 4 more homes in the Comox Valley in 2019 and 6-8 more homes per year until 2020.

We know from experience how the power of collaboration and partnership can provide affordable housing for our community members, and we highly encourage all our municipalities to consider donating plots of land to be used towards building affordable homes for Habitat for Humanity North Vancouver Island.

Thank you,

Andrea Cupelli
Coordinator for the Comox Valley Coalition to End Homelessness

THE CORPORATION OF THE CITY OF COURTENAY

STAFF REPORT

To: Council **File No.:** 07710-20 P&R MP

From: Chief Administrative Officer **Date:** January 21, 2019

Subject: Parks and Recreation Master Plan

PURPOSE:

The purpose of this report is to introduce the draft Parks and Recreation Master Plan, and get direction from Council on releasing the Plan for final comments from the community.

CAO RECOMMENDATIONS:

That based on the January 21, 2018 staff report "Parks and Recreation Master Plan", Council approve OPTION 1 and release the draft master plan for final feedback.

Respectfully submitted,

David Allen, BES, CLGEM, SCLGM
Chief Administrative Officer

BACKGROUND:

In 2016 staff hired Urban Systems to assist in the preparation of a Parks and Recreation Master Plan (Plan). Beginning with a thorough evaluation of the condition of the City assets, thousands of data points were collected along with the condition of trails, parks, furnishings, buildings, sports fields, and playgrounds. This information was used as a foundation for the next phases.

The inventory and analysis phase included:

- the identification of trail gaps,
- the distribution and quantity of parks in various classifications,
- relevant documents,
- recreation programs, facilities and services.

The recommendations from this informed the draft Plan and served as a starting point for the public consultation phase.

Over a four day period, City staff and consultants met with the public through eight focus groups and two community workshops to provide feedback. Council members were invited to attend all of the sessions.

The following is a listing of the organizations invited to the focus group sessions:

Recreation Advisory Groups:

CRA Board members, Evergreen Club Executive, Youth Advisory, Accessibility Committee, Early Years, Boys and Girls Club.

Indoor Recreation:

Squash Club, Recreation Instructors, Special Needs Rec, Cozy Corner Preschool, Blue Devils Swim Club, Senior Badminton.

Recreation Staff:

21 staff attended.

Cultural Groups:

CV Art Gallery, CV Community Arts Council, DCBIA, Sid Williams Theatre, Museum, CV Multicultural Society, Simms Concert Series, Elevate the Arts, Strathcona Symphony, K'omoks First Nation, CYMC, CV Pride, CV Farmers Market Assoc., VI Regional Library, HMCS Quadra.

Outdoor Recreation and Associated Groups:

CV Road Runners, K'omoks First Nation, Cycling Coalition, Project Watershed, CV Triathlon Club, Comox Bay Sailing Club, Courtenay Marina Society, CV harbour Authority, Glacier Machinery Club, CV Paddlers, Active Comox Valley, CV Mountaineering, Nordic Pole Walkers, Fish and Game Club, CV Cougars, LUSH Valley, CV Horseshoe Club.

Sports Fields and Courts:

Lawn Bowling Club, Raiders Football, CV Tennis Club, CV Baseball, CV Slo-pitch, Sports and Social Club, CV Lacrosse, CV United Soccer, CV Pickle Ball Association, CV Kickers Rugby, CV Youth Basketball Assoc., CV Field Hockey League, Evergreen Club Slo-pitch, Dawn to Dawn Soccer, Special Olympics, 55+ BC Games.

City Staff:

Public Works Services, Parks, Recreation, Planning and Development Services, Asset Management Technical Services, Engineering, Legislative Services, Finance, CAO, and Strategic Initiatives.

Municipal Partners:

CVRD, Town of Comox, Village of Cumberland, City of Courtenay, School District 71, 19 Wing Comox, K'omoks First Nation, Black Creek Community Centre, North Island College.

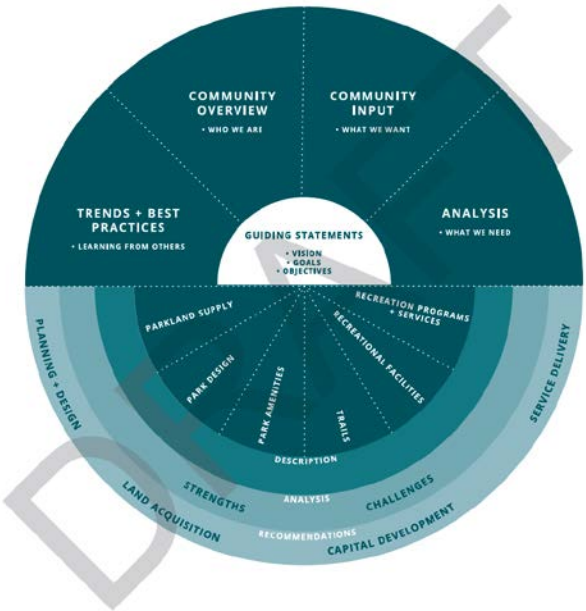
Community Workshops:

In addition to an open invitation to the community, the following groups were invited to the workshops:

Elementary, middle and high school PAC's and Phys. Ed teachers, Courtenay Rotary Club, Strathcona Sunrise Rotary Club, CV Monarch Lions, Kinsmen, Kiwanis Club, and Soroptimist Club

A survey was developed to gather feedback from the community. Almost 1,000 responses were received. The results of the analysis and community feedback were tabulated over the winter of 2017/2018, analysed and informed the draft Plan for council consideration.

The graphic to the right shows the methodology used to develop the master plan findings.



Once finalized and adopted, the Plan will be a tool for staff and council decision making, and will set the stage for Council's consideration of levels of service, and the public's willingness to pay. It will

be presented to council for adoption when final feedback has been received.

DISCUSSION:

The draft Parks and Recreation Master Plan covers the following topics:

- Parks and Recreation trends and best practices
- Parks and Recreation vision, goals and objectives
- Park land distribution for each classification of park including recommendations to ensure an adequate distribution of park land
- Trail provisions, and gaps
- Design and development recommendations for:
    - parks
    - trails
    - recreation facilities
    - recreation services and programs
- Recommended areas for further study. Examples include the need for park development plans, park management plans for natural areas, trail design and construction

Due to the size of the draft Plan (approx. 150 pages) the following hyperlink is provided:
https://www.courtenay.ca/assets/City~Hall/Council/Agendas/2019/2019-01-21%20Parks%20and%20Recreation%20Master%20Plan%20DRAFT.pdf

FINANCIAL IMPLICATIONS:

Similar to the OCP, the Parks and Recreation Master Plan is a guiding document that doesn't commit the City to the financial implications of implementation. Initiatives will addressed through one of the following methods:

- Established by Council as a strategic priority
- Risk, asset or infrastructure issues will be evaluated by the Asset Management Working Group and proposed to Council with other similar initiatives.
- New items or service level changes will be proposed to Council through the budget process.

The implementation plan is a separate document that identifies the priority of each recommendation and the relative cost.

ADMINISTRATIVE IMPLICATIONS:

The Recreation and Cultural Services Department has overseen the development of this document and will work with Council to implement any approved recommendations. The Parks and Recreation Advisory Commission will also make recommendations on initiatives and will report to council as needed.

ASSET MANAGEMENT IMPLICATIONS:

Master plans provide guidance to Council and inform the City's Asset Management Program. They help staff identify synergies between current issues and future plans in order to execute projects with maximum efficiency.

STRATEGIC PRIORITIES REFERENCE:

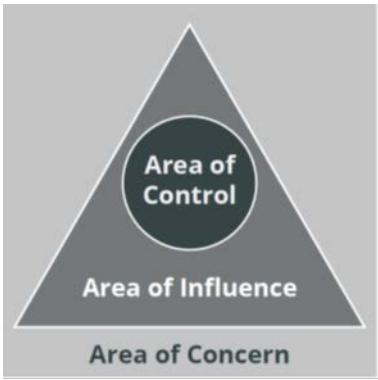
The following strategic priorities will apply:

We focus on organizational and governance excellence

- We support and encourage initiatives to improve efficiencies
- We recognize staff capacity is a finite resource
- Communication with our community is a priority, and is considered in all decisions we make
- We responsibly provide services at a level which the people we serve are willing to pay

We invest in our key relationships

- We value and recognize the importance of our volunteers
- We will continue to engage and partner with service organizations for community benefit



- **Area of Control**
  The policy, works and programming matters that fall within Council's jurisdictional authority to act.
- **Area of Influence**
  Matters that fall within shared or agreed jurisdiction between Council and another government or party.
- **Area of Concern**
  Matters of interest outside Council's jurisdictional authority to act.

OFFICIAL COMMUNITY PLAN REFERENCE:

The OCP identifies the following vision:

The vision for the City of Courtenay is for a City that is unique and different from other communities. It is to become the most liveable community in the province. It can be expressed as having:

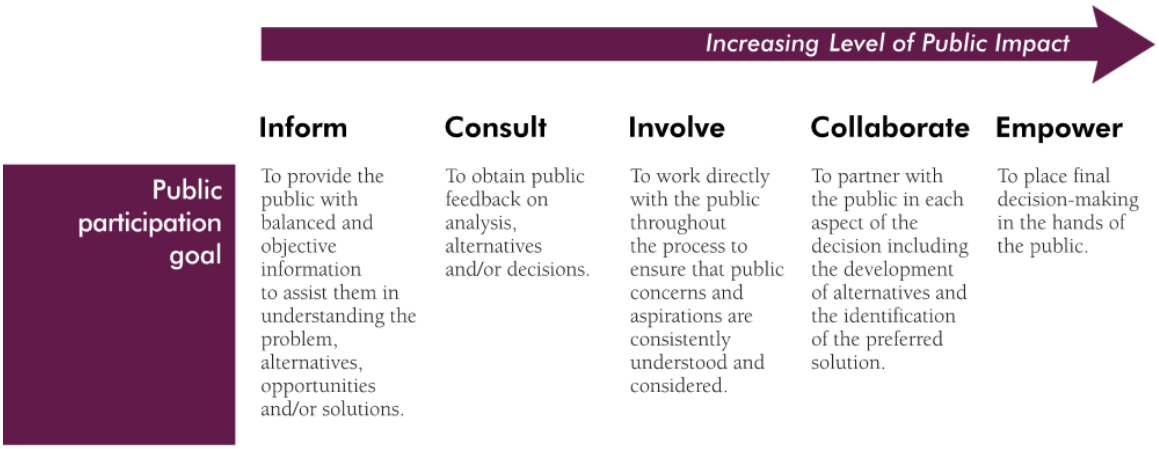
- *an inclusive, open and caring community*
- *commitment to continued excellence*
- *a strong downtown*
- *the ability to ensure a high level of aesthetic and architectural design*
- *a reputation as the premier regional centre for arts and culture*
- *balance and ability to lead growth and the provision of services*
- *a role to be the centre of commerce for the Comox Valley*
- *an expanding parks, natural areas and greenways system*
- *a strategy to lead in environmental protection*
- *commitment to serve youth and seniors*
- *support for a viable agricultural economy and ensure the protection of agricultural Lands*

REGIONAL GROWTH STRATEGY REFERENCE:

No specific reference

CITIZEN/PUBLIC ENGAGEMENT:

Staff have **consulted** with the community through the engagement processes identified above as identified in the *IAP2 Spectrum of Public Participation.*



OPTIONS:

1. Council release the draft Parks and Recreation Master Plan to the community for final feedback.
2. Council refer the draft Parks and Recreation Master Plan back to staff for further consideration or consultation.
3. Council refer the draft Parks and Recreation Master Plan to a future meeting for further discussion.

Prepared by:

Dave Snider *BCSLA*

Director of Recreation and Cultural Services

THE CORPORATION OF THE CITY OF COURTENAY

STAFF REPORT

To: Council **File No.:** 4320-20

From: Chief Administrative Officer **Date:** January 21st, 2019

Subject: Structural Change Application for Manufacturing Facility (Gladstone Brewing) – 244 4th Street

PURPOSE:

The purpose of the report is to provide Council with the result of public notification of the above-referenced application made to the Liquor & Cannabis Regulation Branch (LCRB) by Gladstone Brewing.

CAO RECOMMENDATIONS:

THAT, based on the January 21st, 2019 staff report, 'Structural Change Application for Manufacturing Facility (Gladstone Brewing) – 244 4th Street', Council approve OPTION 1 as follows:

1) The Council of the City of Courtenay recommends the LCRB approve the application by Gladstone Brewing's for structural change of the existing licence.

2) Council's comments on the prescribed considerations are as follows:
   (a) If the amendment application is approved, it would not result in an increase of noise on the community in the immediate vicinity of the establishment;

   (b) If the application is approved, it would not negatively impact the community based on the submissions received from the public;

   (c) In order to gather the views of residents, the City of Courtenay posted a notice on the City's website outlining the application. Additionally, the RCMP was contacted for comment.

Respectfully submitted,

David Allen, BES, CLGEM, SCLGM
Chief Administrative Officer

BACKGROUND:

The applicant, the Gladstone Brewing Company, is in the process of making application for a structural change for their existing manufacturing facility licence to the Liquor & Cannabis Regulation Branch (LCRB). Pursuant to section 38 (3)(c) of the *Liquor Control and Licensing Act*, the City advertised a public notice on the City's website from January 8th to January 21st in order to gather the views of the residents. The Comox

Valley RCMP responded during the standard referral period and has no concern with the application. During public notification period, staff received no comments.

DISCUSSION:

The proposal is to create additional space inside, approximately 120 ft^2 in size. No exterior building renovations or alterations are involved. Permitted occupancy load would increase from 30 to 49 (maximum) as the result of the renovation. The subject property is within Commercial One (C-1), downtown. Staff view of the application is that there will be no negative impacts in terms of land use.

The proposed hours of operation remains the same: 12:00 p.m. to 11:00 p.m. daily (12:00 p.m. on Thursdays, Fridays, and Saturdays). **Staff is in support of this application**.

FINANCIAL IMPLICATIONS:

There is no direct financial implication related to this application.

ADMINISTRATIVE IMPLICATIONS:

Administration of liquor licencing is included in the City's general statutory duties. To date, staff has spent six hours to process the application.

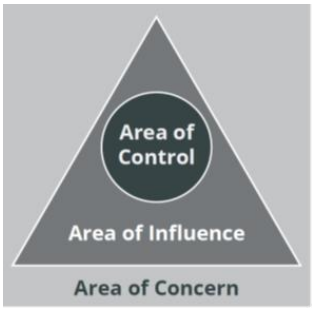
ASSET MANAGEMENT IMPLICATIONS:

There is no direct asset management implications related to this application.

STRATEGIC PRIORITIES REFERENCE:

We focus on organizational and governance excellence

- We support meeting the fundamental corporate and statutory obligations



- **Area of Control**
  The policy, works and programming matters that fall within Council's jurisdictional authority to act.

OFFICIAL COMMUNITY PLAN REFERENCE:

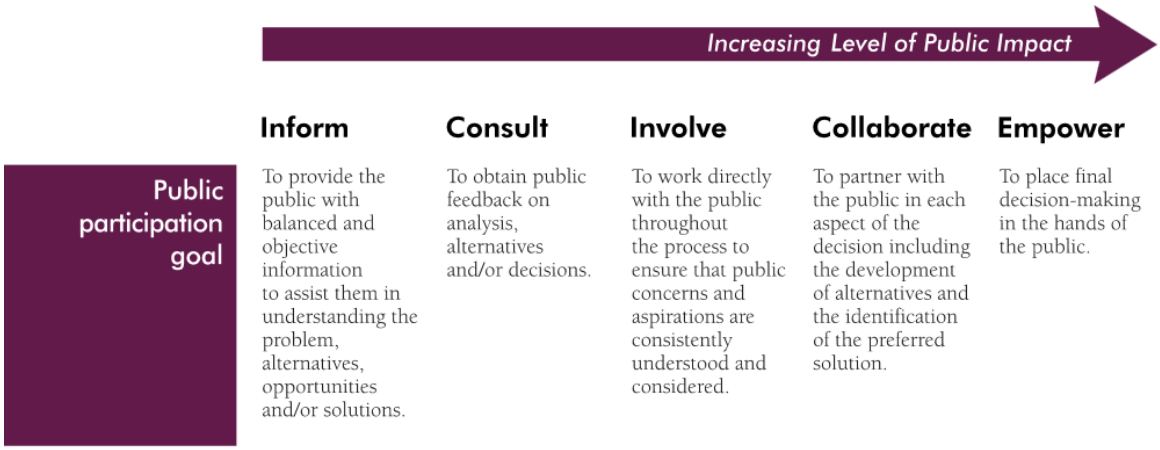
There is no direct reference related to this application.

REGIONAL GROWTH STRATEGY REFERENCE:

There is no direct reference related to this application.

CITIZEN/PUBLIC ENGAGEMENT:

Staff will consult members of the public based on the IAP2 Spectrum of Public Participation:



Public comment gathering period is open on the City's web page from January 8th to 21st, 2019. The City has not received any comments at the time this report was written. Any comments received prior to the Council meeting will be forwarded to Council for their consideration.

OPTIONS:

Option 1: 1) The Council of the City of Courtenay recommends the LCRB approve the application by Gladstone Brewing's for structural change of the existing licence.

2) Council's comments on the prescribed considerations are as follows:
   (a) If the amendment application is approved, it would not result in an increase of noise on the community in the immediate vicinity of the establishment;
   (b) If the application is approved, it would not negatively impact the community based on the submissions received from the public; and
   (c) In order to gather the views of residents, the City of Courtenay posted a notice on the City's website outlining the application. Additionally, the RCMP was contacted for comment. (**Recommended**)

Option 2: That Council not recommend approval of the application.

Prepared by:

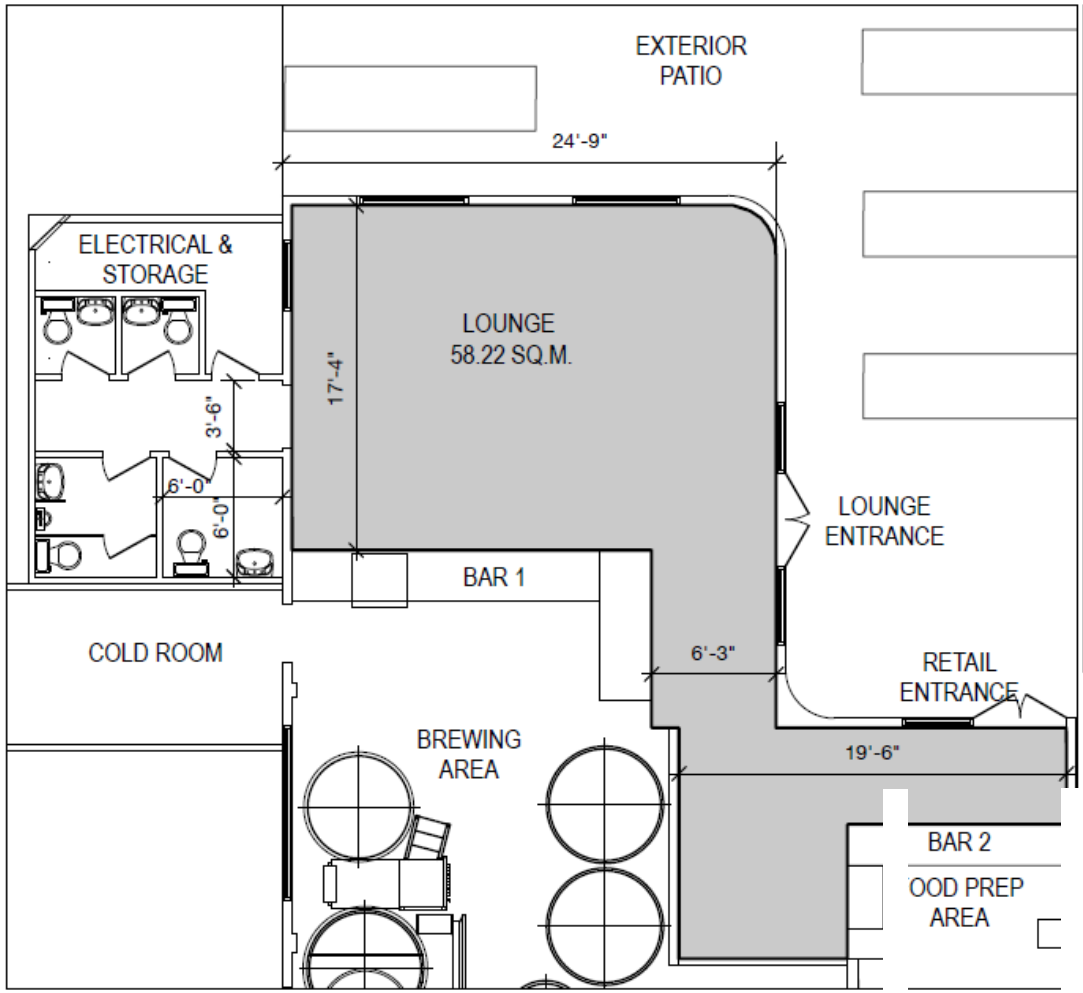
Tatsuyuki Setta, MCIP, RPP
Manager of Planning

Reviewed by:

Ian Buck, MCIP, RPP
Director of Development Services

Attachment: 1. Attachment No.1: Architectural Drawing (interior lounge and retail area)

Attachment No.1: Architectural Drawing (interior lounge and retail area)



INTERIOR LOUNGE & RETAIL AREA:
58.22 SQUARE METERS (626.74 SQUARE FEET)

THE TOTAL OCCUPANT LOAD PERMITTED
BY THE BRITISH COLUMBIA BUILDING CODE, 2012:

58.22 SQ. M. / 1.2 SQ. M. PER PERSON =

49 PERSONS

NOTE:
THE SIGNATURE AND SEAL AFFIXED TO THIS PLAN ARE FOR THE SOLE PURPOSE OF VERIFYING THE OCCUPANCY LOAD FOR THE INTERIOR LOUNGE AREA ONLY AND IN NO WAY CERTIFIES THAT THE BUILDING CONFORMS TO CURRENT BUILDING CODE OR LOCAL BYLAW REQUIREMENTS FOR A LICENCED BEVERAGE ESTABLISHMENT. THE PLAN OF GLADSTONE BREWERY HAS BEEN PREPARED FROM MEASUREMENTS AND INFORMATION PROVIDED BY THE OWNER.

DRAWING No:	PROJECT:	DRAWING TITLE:	SCALE
A1	GLADSTONE BREWING COMPANY 244 4th Street, Courtenay BC	LOUNGE LIQUOR LICENSE APPLICATION	NOT SCALE PROJE NO.: 1228 DATE: 04 OC BER 2018

Phillipa Atwood Architect

5 Little Bear Way Royston BC
t 250-703-0433 c 250-218-0724
pippa @ patwoodarchitect . ca

THE CORPORATION OF THE CITY OF COURTENAY

STAFF REPORT

To: Council **File No.:** 3060-20-1830

From: Chief Administrative Officer **Date:** January 21, 2019

Subject: Development Variance Permit for 3420 Rhys Rd (The Ridge Phase 3B)

PURPOSE:

The purpose of this report is for Council to consider the issuance of a Development Variance Permit to reduce the minimum lot frontage requirements on five residential lots proposed within Phase 3B of The Ridge. Phase 3B of The Ridge involves the subdivision and subsequent development of 61 residential lots located at 3420 Rhys Road, legally described as Lot B, District Lot 153, Comox District, Plan EPP19353 except Part in Plan EPP73209.

CAO RECOMMENDATIONS:

THAT based on the January 21st, 2019 Staff report, "Development Variance Permit No. 1830 - 3420 Rhys Rd", Council approve OPTION 1 and issue Development Variance Permit No. 1830.

Respectfully submitted,

David Allen, BES, CLGEM, SCLGM
Chief Administrative Officer

BACKGROUND:

The subject property is a previously cleared site located in South Courtenay in a residential development known as The Ridge (Figure No. 1). Land within The Ridge was rezoned to a mix of multi-residential, single residential and park uses in September 2011. Development permits were issued for the first phase of the development in 2012, the second phase in 2016 and the remainder of the development in 2018.

The applicant and has applied for a Development Variance permit to reduce the minimum frontage requirements on five of the sixty-one new residential lots in the subdivision.

A drawing of the proposed subdivision layout is

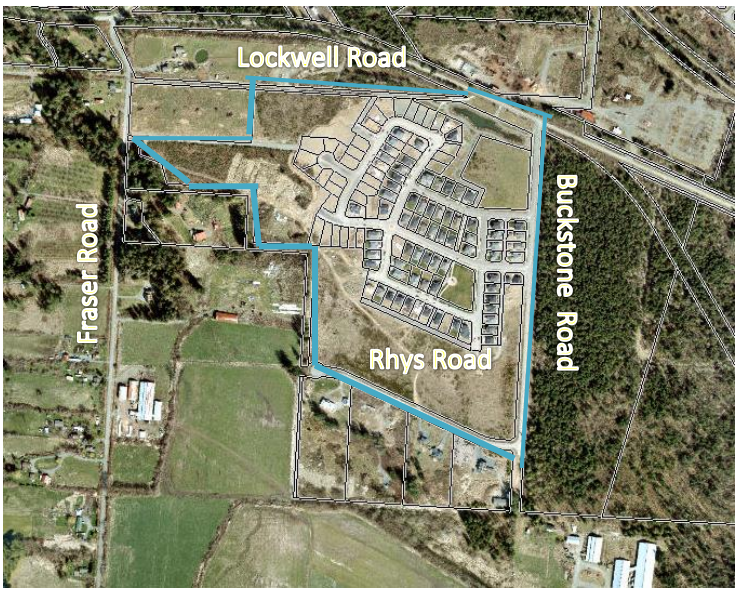


Figure No. 1: The Ridge shown outlined in blue

included in the Draft Development Variance Permit contained within **Attachment No. 1.**

The lots are zoned Comprehensive Development Zone 21 (CD-21) which allows for single residential homes and secondary suites on all lots. Duplex dwellings and carriage houses are permitted on larger corner lots if they meet lot size and frontage requirements in the zoning.

Figure No. 2 (Left)**:** The Ridge shown outlined in yellow.

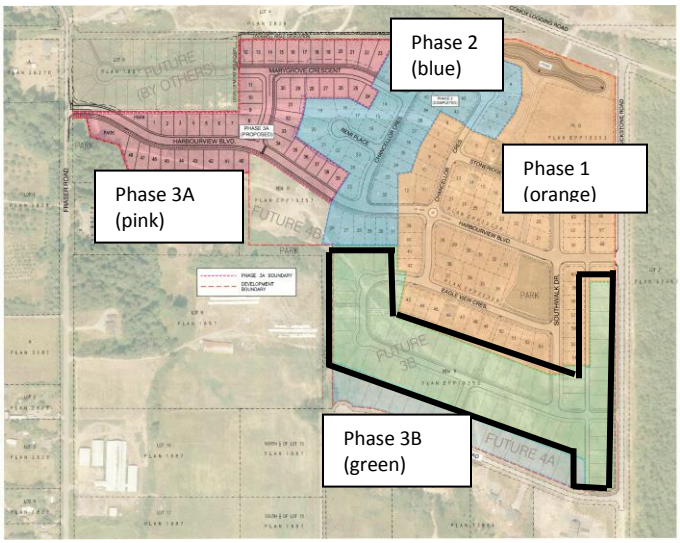


Figure No. 3: Development Concept Plan. Boundary of Phase 3B is shown with a solid black line.

DISCUSSION:

Official Community Plan and South Courtenay Local Area Plan

In June 2018 and October 2018 staff received development permit applications for Phase 3A (48 lots) and Phase 3B (61 lots) of The Ridge. These development permit applications were processed concurrently by Planning Staff and were assessed and evaluated as being consistent with the guidelines in the SCLAP.

In November 2018 Development Permit No. 1819 for the form and character of Phase 3 was approved by the Director of Development Services, however, the request to vary the minimum frontage requirements on the residential lots requires City Council approval.

Zoning Compliance

The proposed subdivision plan is consistent with the CD-21 regulations including minimum lot size, lot depth and lot frontage with the exception of the frontages on the five lots noted below.

Lot Number	**Frontage Requirement**	**Proposal**
51	16.0 metres	10.99 metres
56	16.0 metres	14.27 metres

57	16.0 metres	12.56 metres
58	16.0 metres	11.48 metres
59	16.0 metres	14.72 metres

Table No. 1 Summary of Zoning Requirements and Requested Variances

The five lots being varied are located in bulb-out sections of the road. When measured at the property line the frontages are less than required in the zoning bylaw, however when measured at the front building setback, the frontages would meet the 16.0 metre requirement. The rationale for measuring the frontage at the required front building setback is consistent with other single residential zones in the City. As an example, the Residential One (R-1) zone has a stated exception for lots fronting the bulb of a cul-de-sac allowing the frontage to be measured at the front yard setback line rather than at the property line. The applicant wishes to extend this rationale to the proposed subdivision and have demonstrated that the variance will still result in lots with a size and shape that can adequately accommodate the construction of single family residences (Figure No. 4). Similar variances have been granted in Phase 2 of the Ridge development.

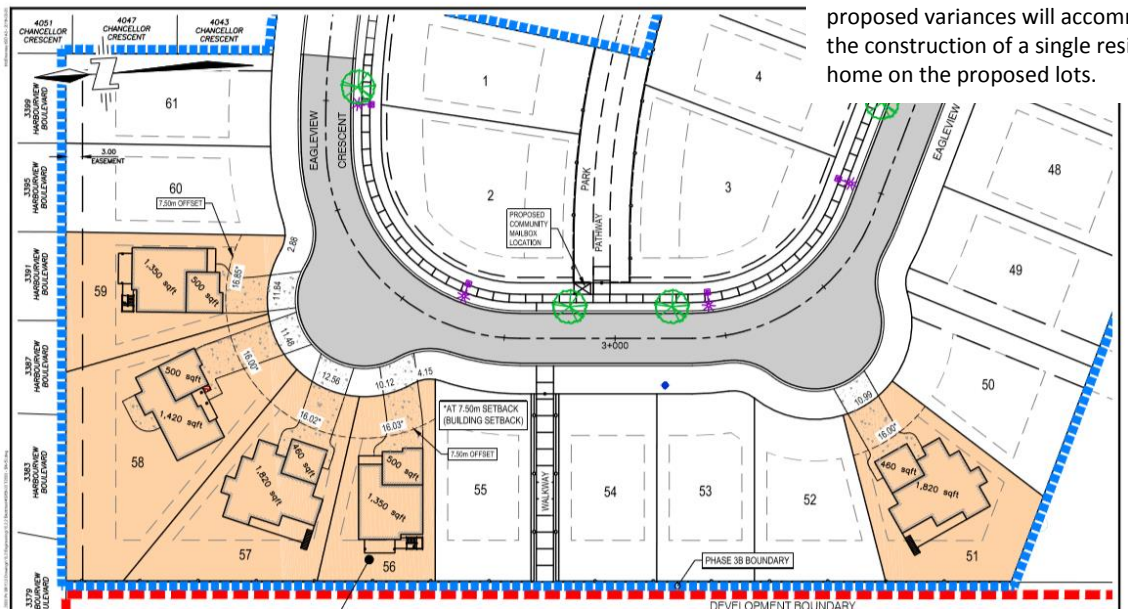


Figure No. 4. Demonstration that the proposed variances will accommodate the construction of a single residential home on the proposed lots.

If these variances are approved, each lot will be able to accommodate the construction of single family dwelling that meets building setbacks and parking requirements in the CD-21 zone. Also, the applicant's Engineer has confirmed that the reduced property frontages will not create safety or maintenance issues on the fronting road (Eagleview Crescent). **Staff assesses the requested variances as minor and supportable.**

FINANCIAL IMPLICATIONS:

There are no direct financial implications related to the processing of this Development Variance Permit as the fees are designed to offset administrative costs. The application fee for the Development Variance Permit was $1,500.

Should the Development Variance Permit be approved, the applicant will be required to apply for subdivision approval. Subdivision fees are currently $600 for the first parcel plus $150.00 for each additional lot. Development Cost Charges will be collected at the time of subdivision at the rate set out in the DCC Bylaw.

Following subdivision, property owners would be required to apply for a Building Permit and subsequent inspections. Building permit fees are $7.50 for every $1,000.00 of construction value.

Amenity fee contributions towards the Affordable Housing Reserve Funds and the Parks, Recreation, Cultural and Seniors Facilities Reserve Fund were secured through the rezoning process and will be collected for each lot at the time of Building Permit. Amenity fee contributions are based on lot size. Based on the proposed subdivision plan, total amenity fees will vary from $3,000 to $4,000 per lot divided equally into the two reserve funds.

ADMINISTRATIVE IMPLICATIONS:

Processing development variance permits is a statutory component of the work plan. Staff has spent approximately 18 hours processing this application to date. Should the proposed development variance permit be approved, an additional 2 hours of staff time will be required to register the permit and close the file. Additional staff time will be required to process subsequent subdivision and building permit applications including inspections.

ASSET MANAGEMENT IMPLICATIONS:

There are no immediate asset management implications related to the proposed development. The developer is responsible for the design and installation of all required infrastructure. However, once the public infrastructure is installed, including parks, trails, roads, sidewalks, street trees, and stormwater, water and sewer systems, the City will assume ownership and maintenance of this infrastructure. Staff works closely with the applicant through the subdivision and building phases to ensure that the infrastructure design and installation meet City requirements.

STRATEGIC PRIORITIES REFERENCE:

Development applications fall within Council's area of control and specifically align with the strategic priority to support meeting the fundamental corporate and statutory obligations of the City. This application also meets the goal to support densification aligned with the Regional Growth Strategy.

OFFICIAL COMMUNITY PLAN REFERENCE:

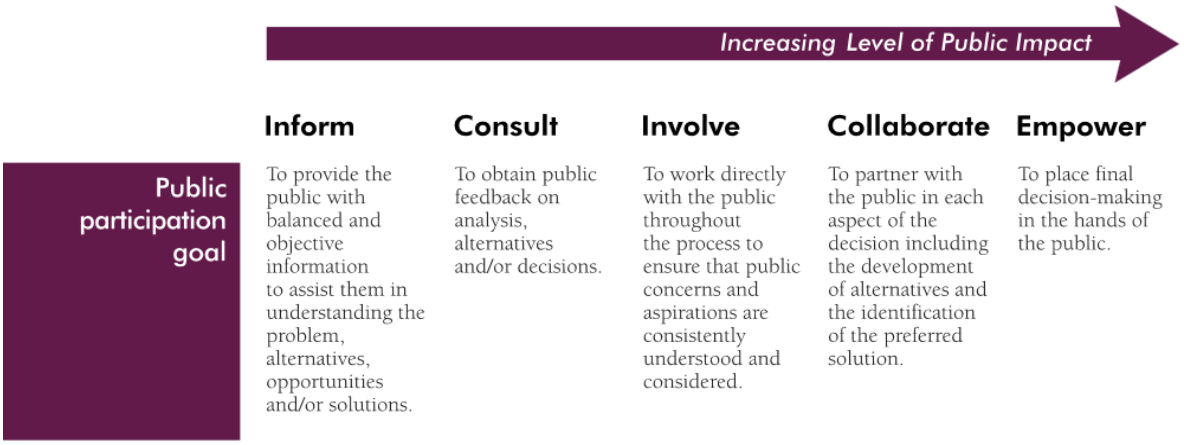
The subject property is designated as Mater Planned Residential and the proposed subdivision plan and variances are consistent with this designation.

REGIONAL GROWTH STRATEGY REFERENCE:

The proposed development is located within the core settlement area outlined in the Comox Valley Regional Growth Strategy. The Regional Growth Strategy states that at least 90% of growth in the Comox Valley should be directed to Core Settlement Areas.

CITIZEN/PUBLIC ENGAGEMENT:

As per Council's direction, under the IAP2 Spectrum of Public Participation the level of public input that has been undertaken is "**Consult"**.



The applicant held a public information meeting on November 30, 2018 at 4161 Chancellor Crescent. According to the public information meeting summary twelve people attended the meeting **(Attachment No. 3)**.

In accordance with the Local Government Act, the City has notified property owners and occupants within 30 metres of the subject property of the requested variances and provided the opportunity to submit written feedback. To date, staff has not received any responses.

OPTIONS:

OPTION 1: (Recommended) THAT based on the January 21st, 2019 Staff report, "Development Variance Permit No. 1830 - 3420 Rhys Rd", Council approve OPTION 1 and issue Development Variance Permit No. 1830.

OPTION 2: Defer consideration of Development Variance Permit No. 1830 pending receipt of further information.

OPTION 3: Not approve Development Variance Permit No. 1830 and direct the applicant to reconfigure the subdivision to meet the frontage requirements in *Zoning Bylaw No, 2500, 2007*.

Prepared by:

Dana Beatson, MCIP, RPP
Land Use Planner

Ian Buck, MCIP, RPP
Director of Development Services

Attachments:

Attachment No.1: Draft Development Variance Permit No. 1830

- *Proposed Subdivision (Schedule No. 1)*
- *Plan Illustrating Reduced Lot Frontages on the Proposed Lots, Building Envelopes and Parking (Schedule No. 1)*

Attachment No. 2: Public Information Meeting Summary and Resident Sign in Sheet

Attachment No. 3: Applicant's Letter

ATTACHMENT NO. 1
Draft Development Variance Permit

THE CORPORATION OF THE CITY OF COURTENAY

Permit No. 3060-20-1830

DEVELOPMENT VARIANCE PERMIT

To issue a Development Permit with Variance

To: Name: Buckstone Investments Ltd., Inc. No BC0822663
Address: 1984 Comox Avenue, Comox BC, V9M 3M7

Property to which permit refers:

Legal: Lot B, District Lot 153, Comox District Plan, EPP19353 Except Part In Plan EPP73209
Civic: 3420 Rhys Road

Conditions of Permit:

Permit issued to for the property legally described as Lot B, District Lot 153, Comox District Plan, EPP19353 Except Part In Plan EPP73209, allowing for future subdivision creating 61 residential lots with the following variances to the *City Of Courtenay Zoning Bylaw No. 2500, 2007:*

Section 8.48.4 – Minimum Lot Frontage

1. Reduce the minimum lot frontage for proposed lot 51 from 16.0 m to 10.99 m;
2. Reduce the minimum lot frontage for proposed lot 56 from 16.0 m to 14.27 m;
3. Reduce the minimum lot frontage for proposed lot 57 from 16.0 m to 12.56 m;
4. Reduce the minimum lot frontage for proposed lot 58 from 16.0 m to 11.48 m; and
5. Reduce the minimum lot frontage for proposed lot 59 from 16.0 m to 14.72 m.

Development Variance Permit No. 1830 is subject to the following conditions:

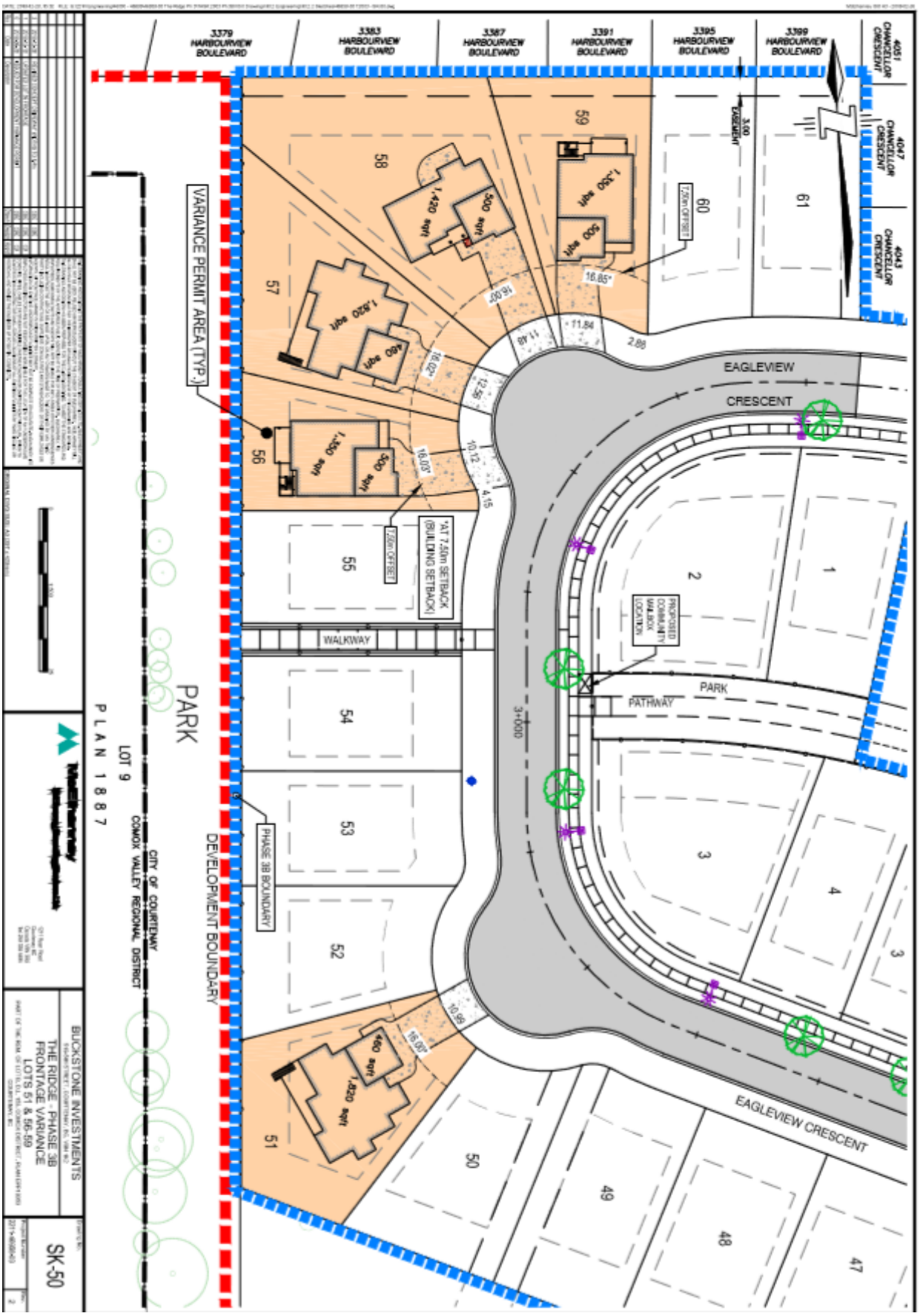
- That the development shall conform to the plan as shown in Schedule No. 1; and
- That a formal amendment application is required if the plans change or additional variances are identified after the permit is issued.

Time Schedule of Development and Lapse of Permit

That if the permit holder has not substantially commenced the construction authorized by this permit within (12) months after the date it was issued, the permit lapses.

Date Director of Legislative Services


PROPOSED SUBDIVISION PLAN OF PART THE REMAINDER OF
LOT B, DISTRICT LOT 153, COMOX DISTRICT, PLAN EPP19353
BCGS 92F.066
SCALE 1 : 750
(ALL DISTANCES ARE SHOWN IN METRES)
THE INTENDED PLOT SIZE OF THIS PLAN IS 560mm IN WIDTH BY 432mm IN HEIGHT (D SIZE) WHEN PLOTTED AT A SCALE OF 1 : 750.
LEGEND
BEARINGS ARE GRID BEARINGS AND ARE DERIVED FROM PLAN EPP19353
PARK
EAGLEVIEW CRESCENT
(20.000 WIDE)
ROAD 'B'
(20.000 WIDE)
DRIVE
(20.000 WIDE)
CHANCELLOR CRESCENT
SOUTHWALK
HARBOURVIEW BOULEVARD
BUCKSTONE ROAD
LANE
Pt. Rem B
PLAN EPP19353
Pl. Rem
PLAN 1887
EASEMENT PLAN EPP
SRW PLAN EPP
DRAFT


3379 HARBOURVIEW BOULEVARD
3383 HARBOURVIEW BOULEVARD
3387 HARBOURVIEW BOULEVARD
3391 HARBOURVIEW BOULEVARD
3395 HARBOURVIEW BOULEVARD
3399 HARBOURVIEW BOULEVARD
4051 CHANCELLOR CRESCENT
4047 CHANCELLOR CRESCENT
4043 CHANCELLOR CRESCENT
VARIANCE PERMIT AREA (TYP.)
EAGLEVIEW CRESCENT
PROPOSED COMMUNITY MAILBOX LOCATION
PARK
PATHWAY
WALKWAY
PHASE 3B BOUNDARY
DEVELOPMENT BOUNDARY
EAGLEVIEW CRESCENT
PARK
LOT 9
PLAN 1887
CITY OF COURTENAY
COMOX VALLEY REGIONAL DISTRICT
BUCKSTONE INVESTMENTS
THE RIDGE - PHASE 3B
FRONTAGE VARIANCE
LOTS 51 & 56-59
SK-50

ATTACHMENT NO. 2
Public Information Meeting Summary

McElhanney

November 30, 2018

Our File: 2211-46958-03
City File: 3320-20-1705

Ian Buck, MCIP, RPP, Director of Development Services
Planning Department
City of Courtenay
830 Cliffe Avenue
Courtenay, BC V9N 2J7

Dear Ian,

BUCKSTONE INVESTMENTS - NEIGHBOURHOOD MEETING
PHASE 3B - DEVELOPMENT PERMIT WITH VARIANCES

A neighbourhood meeting regarding the above application was hosted by Buckstone Investments on Wednesday, November 28, 2018.

1) Meeting was located at 4161 Chancellor Crescent, beginning at 5:00pm and finishing at 6:30pm.

2) We have record of 12 residents in attendance (attached).

3) Meeting notification details were hand delivered on November 19, 2018 to all properties as per the list provided by the City of Courtenay, and mailed to all owners listed (not within 30m of the developments).

4) Information provided during the meeting:
   MCSL Plan Phasing 1;
   MCSL PLR Sketch;
   MCSL sketch SK-50;
   MCSL Sheet C-352.

5) Generally, topics of discussion included:
   - Development timing and sequence of construction;
   - Connection of Harbourview to Fraser Road (Phase 3A); and,
   - Plans for future walkways and trails in existing City parks.

6) No completed comment sheets were received.

We trust you find the above information in order. Please do not hesitate to contact the undersigned should any additional information or clarification be required.

Yours truly,

McELHANNEY CONSULTING SERVICES LTD.

Chris Ewing, AScT.
Engineering Tech.

Reviewed by:

Chris Durupt, P. Eng.
Project Engineer

/ldg

cc: Buckstone Developments, Bruce Clapham

PUBLIC INFORMATION MEETING

Nov 28, 2018

SIGN IN SHEET

FOR

The Ridge - Phase 3B

NAME (Please Print)	ADDRESS
[redacted]	3389 RHYS. RD.
	4064 Southwalk Dr.
	4079 Chancellar Cst.
	4055 Buckstone rd.
	3423 Eagleview Cr.
	4154 Chancellor.
	3440 STONERIDGE AVE
	4026 Southwalk. DR.

POSTPONED TO NEW DATE- Wednesday, November 28, 2018

NOTICE OF PUBLIC INFORMATION MEETING
Development Permit with Variances - The Ridge - Phase 3B
3420 Rhys Road

Interested members of the public are invited to a public information meeting regarding the development of the Ridge - Phase 3B - Lot B, DL 230, Comox District, Plan EPP19353 in the City of Courtenay.

Meeting Location: **4161 Chancellor Crescent, Courtenay, BC**

Date & Time: **Wednesday, November 28, 2018 5:00 pm to 6:30 pm**

A Public information Meeting is being held as this property is designated as "Intensive Residential" within the City of Courtenay's Official Community Plan.

The developer's engineer will be available to answer questions between 5:00 pm and 6:30 pm. A sign in sheet and comment form will be available.

For information regarding the public meeting or if you have any questions or comments, please contact McElhanney at 250-338-5495 or courtenay@mcelhanney.com

The RIDGE

McElhanney

ATTACHMENT NO. 3
Applicant's Letter

McElhanney

December 18, 2018

Our File: 2211-46958-03
City File: 3320-20-1705

Ian Buck, MCIP, RPP, Director of Development Services
Planning Department
City of Courtenay
830 Cliffe Avenue
Courtenay, BC V9N 2J7

Dear Mr. Buck,

BUCKSTONE INVESTMENTS – PLANNING REFERRAL COMMENTS
PHASE 3B - DEVELOPMENT PERMIT WITH VARIANCES

Further to the email request from the City dated Dec. 17, 2018, which makes note of Development Service's Planning Referral comments dated November 6, 2018, we offer the following:

1. We confirm the lot frontage variance, as requested, will not induce safety and/or undue maintenance issues.

2. Preliminary grading concerns pertaining to the proposed roadway / bulbing which fronts Lots 51 and 56 through 59, have been revised per City comments. We confirm the revised cul-de-sac bulb grades will not induce safety and /or undue maintenance issues.

We trust this satisfies this requirement for the City of Courtenay Planning Dept's council report. Please do not hesitate to contact the undersigned should any additional information or clarification be required.

Yours truly,

McELHANNEY CONSULTING SERVICES LTD.

Chris Ewing, ASCT.
Engineering Tech.

Reviewed by:

PROFESSIONAL ENGINEER
PROVINCE OF
C. D. DURUPT
37916

Chris Durupt, P. Eng.
Project Engineer
2018/12/18

cc: City of Courtenay, Dana Beatson
Buckstone Developments, Bruce Clapham

THE CORPORATION OF THE CITY OF COURTENAY

STAFF REPORT

To: Council **File No.:** 4320-20

From: Chief Administrative Officer **Date:** January 21st, 2019

Subject: New Lounge Endorsement for Manufacturer Licence Application (Ace Brewing Company Limited) – 150 Mansfield Drive

PURPOSE:

The purpose of the report is to provide Council with the results of public notification of Ace Brewing Company Limited's application made to the Liquor & Cannabis Regulation Branch (LCRB) for their new liquor licence at the above referenced location.

CAO RECOMMENDATIONS:

THAT, based on the January 21st 2019 staff report, 'New Lounge Endorsement for Liquor Manufacturer Licence Application (Ace Brewing Company Limited) – 150 Mansfield Drive**'**, Council approve OPTION 1 as follows:

1) The Council of the City of Courtenay recommends the LCRB approve the application for Ace Brewing Company Limited's new manufacturer licence lounge endorsement.

2) Council's comments on the prescribed considerations are as follows:
   (a) If the amendment application is approved, it would not result in an increase of noise in the area;

   (b) If the application is approved, it would not negatively impact the community based on the submissions received from the public;

   (c) In order to gather the views of residents, the City of Courtenay posted a notice on the City's website outlining the application. Additionally, the RCMP was contacted for comment.

Respectfully submitted,

David Allen, BES, CLGEM, SCLGM
Chief Administrative Officer

BACKGROUND:

The applicant, a Courtenay-based company, is in the process of making application for a new liquor manufacturer licence (brewery) with a lounge endorsement to the Liquor & Cannabis Regulation Branch (LCRB) for the property at 150 Mansfield Drive. The lounge endorsement component requires local government consideration.

DISCUSSION:

Staff has reviewed the application. In terms of land use, the subject property is zoned Commercial Two (C-2), which already permits the proposed use. The existing building has been vacant for the past several years. It was previously occupied by a car dealership. The applicant is not proposing to make changes or alterations to the exterior of the building except a few minor changes such as a new door, a fenced-in outside chiller, a new facia sign and painting, which are not subject to development permit requirement. **Staff is in support of this application**.

The proposed hours of service are from 11:00 a.m. to 11:00 p.m. daily, though the applicant expects to probably close earlier Sunday through Wednesday.

The application has been posted on the City's website for comment and to date no responses have been received. The Comox Valley RCMP has been contacted during the standard referral period and the City has not yet received a response.

At the January 7, 2019 Council meeting two questions were raised in relation to the proposal. The first question related to the age limits for entry into the lounge area. Staff have confirmed minors would be allowed in the lounge if accompanied by parents or guardians. Secondly, Council asked if the 1km rule would apply to liquor sales. Staff have reviewed the *Liquor Control and Licensing Regulation* and note the only reference to the 1km rule is for Licensee Retail Store Licenses (LRS). There is no reference to this requirement in the rules and requirements for a manufacturer on-site store endorsement. Staff have left messages with two people at the province to clarify and as yet have not received a response.

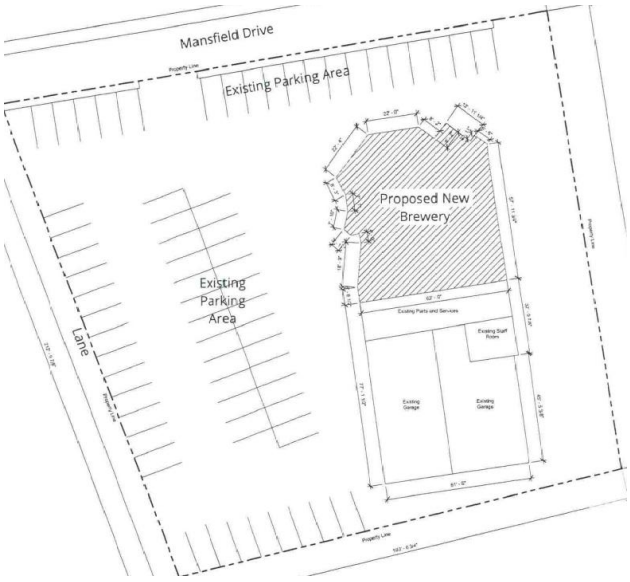


Figure 2. Site plan

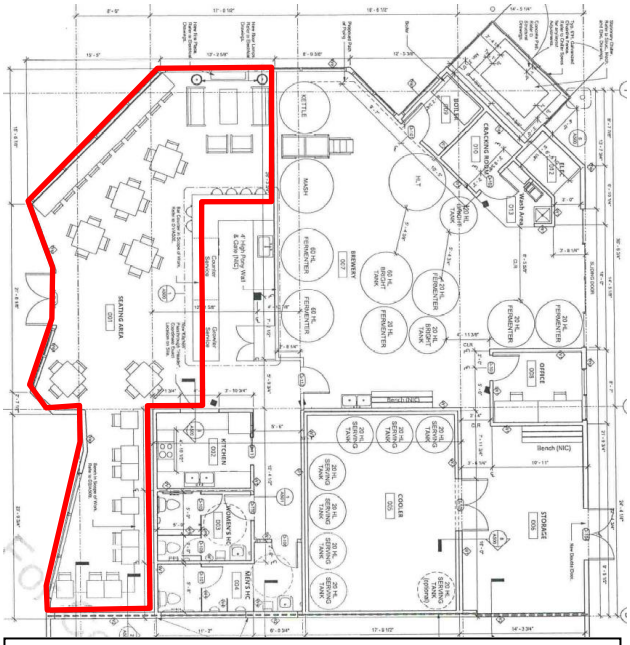


Figure 3. Building plan

The application has been posted on the City's website for comment and to date a total of seven responses have been received (five opposed and two in support). These comments are attached in the report. The Comox Valley RCMP has been contacted during the standard referral period and the RCMP has no issue with the proposal.

The neighbouring residents' concerns relate to noise, competition with the existing pub and liquor store and increased traffic (***Attachment No.1***).

With regard to noise, the proposed lounge is contained in entirely within the building, accordingly staff do not anticipate noise will be an issue. While one of the letters references the potential for a patio in the future, one is not proposed with this application. If the applicant decides to establish an outside patio, they will be required to apply for a structural change application which would be evaluated on its own merits.

As it relates to competition, the property is already zoned for this use and the free market generally dictates the success or failure of concentrated businesses. The licensing for the manufacturing and associated on-site store endorsement does not include local government feedback beyond confirmation of zoning. In this instance Council is being asked to comment on the lounge endorsement. Council may wish to consider the societal implications of concentrated lounge/pub uses on the overall community. However, staff are of the opinion these uses are similar to restaurants that offer alcohol service next to each other.

With respect to traffic it is acknowledged that the conversion of a largely unused building to an active commercial use will increase traffic beyond what exists today. Staff have not identified a history of complaints in this neighbourhood related to noise, parking or other bylaw matters. The City's Development Engineer's view of this proposal is that the use intended is permitted in the zone and the zone permits a wide range of uses with varying degrees of traffic. Normally such a proposal does not trigger a traffic impact study.

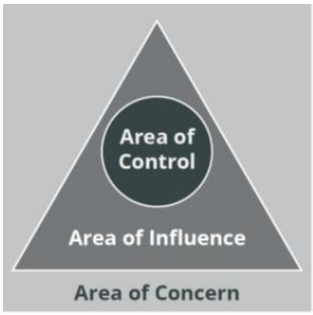
If Council desires a further evaluation of this matter, Council has an option to direct staff to request that the applicant undertake a traffic impact study. Staff do not recommend this and note that numerous other uses are permitted on the property including restaurants and retail sales without any specific Council approval.

FINANCIAL IMPLICATIONS:
There are no direct financial implications related to this application.

ADMINISTRATIVE IMPLICATIONS:
Administration of liquor licencing is included in the City's general statutory duties. To date, staff has spent six hours to process the application.

ASSET MANAGEMENT IMPLICATIONS:
There are no direct asset management implications related to this application.

STRATEGIC PRIORITIES REFERENCE:



We focus on organizational and governance excellence

- We support meeting the fundamental corporate and statutory obligations

- **Area of Control**
  The policy, works and programming matters that fall within Council's iurisdictional authoritv to act.

OFFICIAL COMMUNITY PLAN REFERENCE:

There is no direct reference related to this application.

REGIONAL GROWTH STRATEGY REFERENCE:

There is no direct reference related to this application.

CITIZEN/PUBLIC ENGAGEMENT:

Staff will consult members of the public based on the IAP2 Spectrum of Public Participation:

Increasing Level of Public Impact

Public participation goal	Inform	Consult	Involve	Collaborate	Empower
	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision-making in the hands of the public.

The public comment gathering period is open on the City's web page from January 8th to 21st, 2019. The City has received a total of seven comments at the time this report was written. Any comments received immediately before the Council meeting are to be forwarded to Council for their consideration.

OPTIONS:

OPTION 1: 1) The Council of the City of Courtenay recommends the LCRB approve the application by Ace Brewing Company Limited for their new liquor manufacturer licence lounge endorsement.

2) Council's comments on the prescribed considerations are as follows:

(a) If the amendment application is approved, it would not result in an increase of noise in the area;

(b) If the application is approved, it would not negatively impact the community based on the submissions received from the public;

(c) In order to gather the views of residents, the City of Courtenay posted a notice on the City's website outlining the application. Additionally, the RCMP was contacted for comment. (**Recommended**)

OPTION 2: 1) That Council defer approval of the application; and

2) That Council direct staff to request that the applicant undertake a traffic impact study prior to further consideration.

OPTION 3: That Council recommends the LCRB not approve the application by Ace Brewing Company limited for a liquor manufacturer licence lounge endorsement.

Prepared by:

Mike Grimsrud
Planner 1

Reviewed by:

Ian Buck, MCIP, RPP
Director of Development Services

Attachments:
Attachment No.1 : Residents' comments

Attachment No.1: Residents comments (1/7)

Blamire, Susan

From: [redacted]
Sent: January-11-19 10:30 PM
To: PlanningAlias
Subject: Ace Brewing

To Whom It May Concern,
I believe it would be so wrong to allow Ace Brewing to open basically next door to the Whistle Stop which has been in business for many years in Courtenay there by putting a strain on their business.
Courtenay city council would then be giving the impression that they do not support businesses who have been part of the community for many years.
Why would a community need two businesses serving liquor side by side?
Thank You
[redacted]

Sent from my iPad

Attachment No.1: Residents comments (2/7)

Blamire, Susan

From: [redacted]
Sent: January-09-19 5:31 PM
To: PlanningAlias
Subject: Lights at Mansfield

I see in the paper of the development of a microbrewery/restaurant beside the Whistle Stop Pub. This means yet more traffic on Mansfield. I would like to know who I can speak to about this problem. Something needs to be changed with all the traffic on Mansfield.
[redacted]

Attachment No.1: Residents comments (3/7)

Blamire, Susan

From: [redacted]
Sent: January-13-19 2:55 PM
To: PlanningAlias
Subject: Subject: New Lounge Endorsement for Liquor Manufacturer Licence Application (Ace Brewing Company Limited) – 150 Mansfield Drive

[redacted]

Re: Subject: New Lounge Endorsement for Liquor Manufacturer Licence Application (Ace Brewing Company Limited) – 150 Mansfield Drive

Trumpeter's Landing Condo complex houses 104 apartment style condos in the four building complex and is located directly across the street from the proposed development. My wife and I own our condominium located on the south side of the complex in building one.

I wish to register my objection to an additional pub/lounge being located directly across Mansfield Drive from our residence in Trumpeters landing. My patio door opens to our balcony which overlooks the proposed site for the brewery/proposed lounge. We already endure a great deal of vehicular traffic noise not a small amount which consists of very noisy motorcycles and noisy pick up trucks. Before considering approval of this project I would invite council members and city planning staff to come and sit on our deck or in our suite during some summertime afternoons and evenings. You would quickly learn what we already endure in the way of vehicular noise generated in a great part by the presence of the Whistle Stop and liquor store located at the corner of Mansfield Drive adjacent to the airpark.

During the hot days of summer we have to be able to leave our deck sliding door and our bedroom window and deck access door open to be able to bear the summer heat. During the hot summer we would be in dire physical trouble if we had to keep those entrances open due to excessive noise from outside. There are many times every day that the noise generated by traffic on the close is so loud that it drowns out conversation inside our suite.

We do not normally oppose new development and we enjoy patronizing brew pubs. We currently patronize our current local pub, the Whistle Stop but at times in the summer it would be much quieter where we live if it wasn't there either.

Therefore, we cannot support the idea of an brewery with a lounge/bar and the likely eventual outdoor patio addition to be located so close to a major residential complex and right next door to the existing pub and liquor store.

It appears to me that there is vacant commercial space further north on Cliffe that is not adjacent to existing residential complexes.

Thank you for permitting us to comment on this issue.

[redacted]

Attachment No.1: Residents comments (4/7)

Blamire, Susan

From: [redacted]
Sent: January-14-19 8:23 AM
To: PlanningAlias
Subject: Application for a New Brewery & Pub next to the Whistlestop Pub

I have some concerns about having two pubs adjacent to each other. If it were just a brewery that I could understand. Is this a part of the downtown revitalization plan? It seems to me to have the potential to be a nightmare scenario while detracting from all the pleasures afforded by the Air Park Walkway. I'm all for progress and economic development but this doesn't appear to be a well thought-out plan.

[redacted]

Attachment No.1: Residents comments (5/7)

Blamire, Susan

From: [redacted]
Sent: January-15-19 5:09 PM
To: PlanningAlias
Subject: ACE BREWING COMPANY

To whom it may concern,

I live in building one of 2300 Mansfield Drive and I recently noticed a series of propaganda against the proposed brewery across the street being posted in our building. The letters posted cited loud noise and increased traffic on Mansfield Drive. As someone who has lived in this building for several years I can say that the noise produced by the Whistle Stop (established long before these residences were built) is not significant and the additional business should not be as large of a concern as these residents are making it out to be. I think the brewery would be a great addition to the neighbourhood and would serve the local economy well. As a younger resident of the community it is encouraging to see businesses such as these being established as they can provide jobs for all members of the community and contribute to greater economic success.

Sincerely,

[redacted]

Attachment No.1: Residents comments (6/7)

Blamire, Susan

From: [redacted]
Sent: January-13-19 4:15 PM
To: PlanningAlias
Subject: Oppose the Ace Brewing Company License Application

Dear Sir/Madam,
I live in the Trumpeters Landing complex directly opposite the proposed site of the Ace Brewery Application building and I strongly oppose the granting of said license for the following reasons
We endure the traffic coming and going from the Whistle Stop Pub including the delivery trucks in the early morning.
In the summer months we have enough traffic on Mansfield Drive now!! let alone adding another lounge and brewery from 11AM till 11PM at night!!
We will see significantly higher vehicle and people traffic on Mansfield Drive.
We already have high traffic volumes due to the "off license" at the Whistle Stop Pub and the cars and families travelling to the Courtenay Air Park, this morning January 12th 2019 the parking area for the Airpark Walkway was full, the overflow of cars finding parking on Mansfield Drive.
We will see significant parking issues, overflowing into Care Auto's parking spaces.
Higher noise factor.
More delivery trucks coming and going to both establishments.
More "very loud noisy" motorcycles speeding down Mansfield Drive! There should be at least one speed bump installed on Mansfield Drive to try and curb the excess speed.
More congestion at the intersection of Mansfield and Cliffe Ave creating a very real potential for more accidents!
Patio and Balcony "Ambience" will be more negatively impacted. Forget about having a quiet afternoon or evening with friends on the decks.
Already have had one vehicle parked on Mansfield Drive "totalled" due to careless driving!
Let's not kid ourselves that if the license is approved, Ace Brewing will be applying for an outside patio license in the summer months adding more noise for those of us who want to keep our windows and doors open to allow in cool air.
I implore you to reject the application for a license……[redacted]

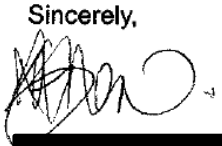
Attachment No.1: Residents comments (7/7)

January 15, 2019

To Whom it May Concern,

I'm writing to express my interest and support for the new Brewery at 150 Mansfield. I think it's a fabulous venture that will fit right in to our thriving City. We have an abundance of new and current residents who are always looking for an establishment to enjoy a social beverage, meet friends and acquaintances at. From what I understand Ace Brewery will provide a clean, upscale Brewery to locals and tourists with quality beer brewed by a recognized and award winning Brew Master. This new establishment will provide jobs, stimulate our economy and provide an excellent place to patronize.
Count me in!

Sincerely,



[redacted]

THE CORPORATION OF THE CITY OF COURTENAY

STAFF REPORT

To: Council **File No.:** 1850-01

From: Chief Administrative Officer **Date:** January 21, 2019

Subject: 2019 Grant-in-Aid Requests

PURPOSE:

The purpose of this report is to present Council with the list of applicants who are requesting funding from the City via the City's Gaming Fund, under the Grant-in-Aid Policy.

POLICY ANALYSIS:

This report is prepared in accordance with the City's Grant-in-Aid Policy #1850.00.04 and complies with Section (25) 1 of the *Community Charter*.

EXECUTIVE SUMMARY:

In 2016, the City revised and adopted a Grant-in-Aid Policy to respond to requests from the Comox Valley community organizations asking for grant money for a variety of projects. To create a transparent and efficient process, older policies were amalgamated and updated to require organizations to submit their grant application annually by August 1st so all requests could be simultaneously presented to Council. Attachment # 2 details the list of organizations requesting a grant for 2019. The gaming funds will be the source of funding for these requests as per policy #1850.00.04

CAO RECOMMENDATIONS:

That based on the January 21, 2019 staff report, "2019 Grant-in-Aid Requests", Council receive the attached list of applicants and support Option 1 to direct Staff to remit Grant-in-Aid payment to the selected 18 applicants meeting 2 or more criteria, with a cap of $15,000 per request; and

That staff include the disbursements in the draft 2019-2023 schedule of gaming funds distribution; and

That staff be directed to review the Grant-in-Aid policy #1850.00.04 and clarify the eligibility criteria for future consideration.

Respectfully submitted,

David Allen, BES, CLGEM, SCLGM
Chief Administrative Officer

BACKGROUND:

On October 31, 2016, City Council adopted a revised Grant-in-Aid policy. It combined two older policies with the intent of providing a single process for the community organizations to follow when requesting financial assistance (see Attachment # 1 – Grant-In-Aid Policy). It identified Gaming Fund revenues as the source of funding for grant payments and was first applied in early 2017.

The deadline for receipt of the 2019 Grant-in-Aid applications was August 1, 2018. Advertising for the 2019 application intake began on May 29, 2018 with advertisement in the local newspaper and notification on the City's webpage followed by posts on the City's Facebook and Twitter in June and July. A last advertisement was posted in the local newspaper on July 24th.

In the previous years, the Grant-in-Aid requests were typically presented to Council in October of each year. The process has been delayed this year due to Elections and the expiry of the 2016-2018 Schedule of Gaming Funds Distribution (see Attachment # 3). Council will be presented with a new Gaming Funds Distribution matrix for 2019-2023, ideally after the establishment of its Strategic Priorities. City Staff suggest not to delay longer the Grant-in-Aid application review as some organizations are waiting to know if their request will be approved in order to prioritize their activities in 2019.

DISCUSSION:

List of applicants

The Grant-in-Aid requests submitted for 2019 varies from $1,000 to $53,200 and the reasons vary from funding for the purchase of furniture to assistance for supportive housing project in Courtenay.

The table below shows the complete list of applicants for 2019.

Category	Name of Organization / Society	Grant Amount Requested for 2019
Downtown Arts & Culture	Comox Valley Arts	$ 53,200
	Downtown Courtenay Business Improvement Association (DCBIA)	$ 15,000
	Comox Valley Multicultural & Immigrant Support Society	$ 3,800
	The Alberni Project Society	$ 3,500
	Western Canada Pulp and Paper Curling Bonspiel	$ 2,000
	Comox Valley Pipe Band Society (CVPBS)	$ 1,000
Downtown Arts & Culture Total		**$ 78,500**
Green Capital Projects/Innovations	Courtenay Lawn Bowling Club	$ 15,000
	Comox Valley Land Trust	$ 8,000
	Comox Valley Nature	$ 3,000
	Morrison Creek Streamkeepers	$ 2,550
	Comox Valley Project Watershed Society	$ 2,500
	Youth and Ecological Restoration Program (YER)	$ 2,000
Green Capital Projects/Innovations Total		**$ 33,050**
Social/Societal Initiatives	Habitat for Humanity Vancouver Island North Society	$ 30,000
	Royal Canadian Legion Branch #17	$ 10,774
	Comox Valley Transition Society (CVTS)on behalf of Comox Valley Coalition to End Homelessness (CVCEH)	$ 8,000
	LUSH Valley Food Action Society	$ 8,000
	The John Howard Society of North Island	$ 7,500
	Comox Valley Transition Society (CVTS)	$ 6,000
	Everybody Deserves a Smile Community Projects Society (EDAS)	$ 5,000
	Indigenous Women's Sharing Society	$ 5,000
	Comox Valley Cycling Coalition (CVCCo)	$ 2,800
Social/Societal Initiatives Total		**$ 83,074**
Grand Total		**$ 194,624**

Community Charter

When reviewing the Grant-in-Aid requests, Council should consider Sections 25 (1) of the *Community Charter:*

> **"25** (1) Unless expressly authorized under this or another Act, a council must not provide a grant, benefit, advantage or other form of assistance to a business, including
>
> (a) any form of assistance referred to in section 24 (1) *[publication of intention to provide certain kinds of assistance]*, or
>
> (b) an exemption from a tax or fee.

The *Community Charter* defines "business" as:

> **"business"** means
>
> (a) carrying on a commercial or industrial activity or undertaking of any kind, and
>
> (b) providing professional, personal or other services for the purpose of gain or profit,
>
> but does not include an activity carried on by the Provincial government, by corporations owned by the Provincial government, by agencies of the Provincial government or by the South Coast British Columbia Transportation Authority or any of its subsidiaries."

None of 2019 applicants qualify as a business.

Other Financial Support from the City

Some organizations already benefit from other financial support from the City, such as the permissive property tax exemption, low-cost lease or in-kind work.

The permissive property tax exemption (policy # 1960.00.01) is similar to the Grant-in-Aid program: not-for-profit organizations apply every year and the approval and amount of the exemption is strictly at the discretion of Council. Following are the Grant-in-Aid applicants approved for a permissive property tax exemption in 2019 (Bylaw No. 2939, 2018 Tax Exemption 2019) and the estimated amount of the City's property tax exemption:

- Comox Valley Transition Society (3 locations): $4,819
- Habitat for Humanity (office space): $314
- The John Howard Society: $2,044
- The Royal Canadian Legion: $7,238

Provision of a low-cost property lease is another means for the City to support not-for-profit organizations. The following Grant-in-Aid applicants also benefit from a low-cost property lease with the City:

- The Courtenay Lawn Bowling Club (1$ annual lease)
- LUSH Valley Food Action Society (in-kind space for the Community Garden expiring November 30, 2018)

Many of the 2019 Grant-in-Aid applicants applied for a grant in 2018. 10 of them were successful in 2018, as shown in Attachment #2.

Gaming Funds Distribution Matrix

Some organizations had a multi-year agreement with the City for financial support, funded by the Gaming Fund and documented in the 2016-2018 Schedule of Gaming Funds Distribution (see Attachment # 3).

Downtown Courtenay Business Improvement Association (DCBIA) has requested in their Grant-in-Aid application the renewal of the annual $5,000 grant to fund downtown cultural events.

The LUSH Valley Food Association Society is also requesting a similar multi-year agreement.

BC Gaming

Applicants can also apply directly to the BC Gaming Commission for Community Gaming grants via the "non-profit community organizations" category. In 2017 / 2018, BC Gaming provided grants of $2,068,575 to various Courtenay organizations. The 6 recipients of the BC Gaming Grant listed below are current applicants for the City's Grant-in-Aid program.

Organization Name	Grant Sector	Payment Amount
Comox Valley Land Trust	Environment	$35,000
Comox Valley Multicultural and Immigrant Support Society	Cultural Expression	$2,500
Comox Valley Project Watershed Society	Environment	$35,000
Comox Valley Transition Society	Human and Social Services	$34,000
LUSH Valley Food Action Society	Human and Social Services	$40,500
The Alberni Project Society	Arts and Culture	$9,000
		$156,000

This information is available on the BC Gaming website below:

https://www2.gov.bc.ca/gov/content/sports-culture/gambling-fundraising/gambling-in-bc/reports-publications-statistics

Many not-for-profit organizations also benefit from other on-going funding from various provincial groups, such as Ministry of Children and Family Development, Ministry of Social Development, Ministry of Public Safety, BC Housing and Vancouver Island Health Authority. This kind of funding is essential to their programming and operations.

Evaluation

The Grant-in-Aid policy is silent on a specific procedure to evaluate and prioritize the applications, therefore City staff established the criteria below to assist Council with their decision:

1. Will the grant benefit the entire community (all ages and groups)?
2. Will this grant be the only financial or in-kind support requested from the City?
3. Did the organization apply for other sources of funding?
4. Is the organization financially sustainable?

Of the 21 applicants: 13 applicants meet 3 or 4 criteria, 5 meet 2 criteria and 3 meet 1 criteria.

Staff recommend a $15,000 cap on each application for 2019 in order to stay within a financially sustainable amount and maximize the number of organizations that benefit from the Grant-in-Aid program.

A summary of the evaluation, along with a brief description of the intended purpose of the grant and the recommended grant amount for 2019 is provided in Attachment # 2.

FINANCIAL IMPLICATIONS:

Local Governments with gaming facilities within its jurisdiction are allowed to use Gaming Fund revenues for "any purpose within their legal authority". For the last 3 years, the City's approach has been to spend the balance of gaming funds from a previous year to support downtown arts and culture, various Council's initiatives and projects, public safety and security, social initiatives, infrastructure works and green or innovation projects (see Attachment # 3). In 2018, gaming funds from 2017 were used to fund the Grant-in-Aid requests. Staff estimate 2018 Revenues of approximately 1 Million dollars to be utilized in the 2019 gaming distribution.

The list of applicants to the City's Grant-in-Aid program is longer every year with 1 request in 2012 and 21 requests in 2018 and 2019. While each organization possibly has a valuable cause to request a grant, Council must weigh the implications of using gaming funds for special interest groups versus applying funds for other City priorities such as:

- Funding for asset management and capital renewal;
- Funding the increased capacity to address sustainable service delivery;
- Funding the RCMP staffing or contributions to the Police Contingency Reserve;
- Contributions to bolster various reserves,
- Funding to support affordable housing and homelessness

- Financial resources for strategic land purchases or,
- Off-setting property tax increase for the community (for reference, $230,000 is equivalent to approximately 1.0% tax increase)

ADMINISTRATIVE IMPLICATIONS:

Approximately 50 hours of staff time was spent to process the list of 2019 grant applicants. It is expected that an additional 5 hours of time will be required to notify and process payments to those organizations selected by Council.

ASSET MANAGEMENT IMPLICATIONS:

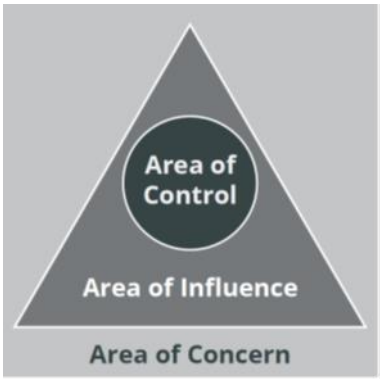
Utilization of gaming funds for Grant-in-Aid potentially limits the amount of funding available for asset management.

STRATEGIC PRIORITIES REFERENCE:

Providing financial resources to organizations in the community and the Valley is a means for the City to follow its strategic priorities as noted below.

We invest in our key relationships

- We will continue to engage and partner with service organizations for community benefit



- **Area of Control**
  The policy, works and programming matters that fall within Council's jurisdictional authority to act.
- **Area of Influence**
  Matters that fall within shared or agreed jurisdiction between Council and another government or party.
- **Area of Concern**
  Matters of interest outside Council's jurisdictional authority to act.

OFFICIAL COMMUNITY PLAN REFERENCE:

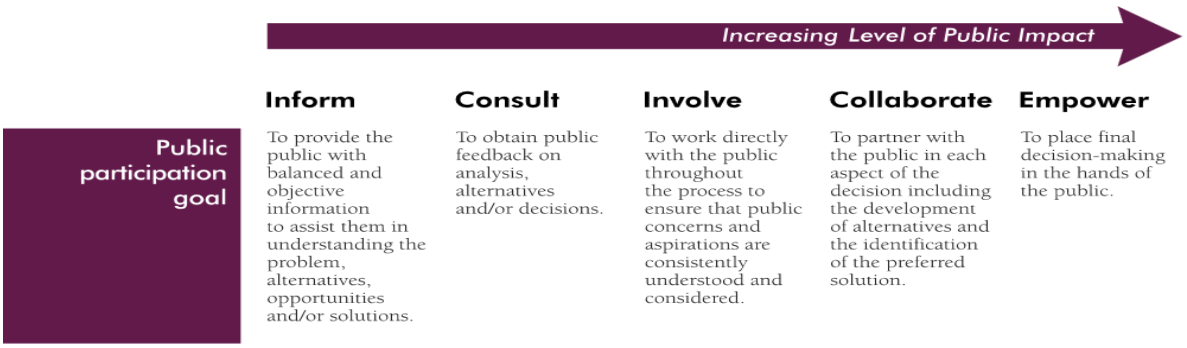
N/A

REGIONAL GROWTH STRATEGY REFERENCE:

N/A

CITIZEN/PUBLIC ENGAGEMENT:

Staff would **inform** the public based on the IAP2 Spectrum of Public Participation:
http://c.ymcdn.com/sites/www.iap2.org/resource/resmgr/imported/IAP2%20Spectrum_vertical.pdf



OPTIONS:

OPTION 1: That Staff be directed to remit Grant-in-Aid payment to the identified 18 applicants meeting 2 or more criteria, with a cap of $15,000 per request; and

That staff include the disbursements in the draft 2019-2023 schedule of gaming funds distribution; and

That staff be directed to review the Grant-in-Aid policy #1850.00.04 and clarify the eligibility criteria for future consideration**.**

OPTION 2: That Staff not remit Grant-in-Aid payment to the identified 18 applicants meeting 2 or more criteria, with a cap of $15,000 per request pending further discussion from Council.

OPTION 3: That Staff be directed to remit Grant-in-Aid payment to the identified 18 applicants meeting 2 or more criteria, with no cap; and

That staff include the disbursements in the draft 2019-2023 schedule of gaming funds distribution; and

That staff be directed to review the Grant-in-Aid policy #1850.00.04 and clarify the eligibility criteria for future consideration**.**

OPTION 4: That Council direct staff to discontinue the Grant-in-Aid program starting in 2019.

Prepared by:

Annie Bérard, CPA, MBA
Manager of Business Performance

Concurrence:

Jennifer Nelson, CPA, CGA
Director of Financial Services

Attachments:

1. Grant-in-Aid Policy
2. List of 2019 Grant Applicants
3. 2016 – 2018 Approved Schedule of Gaming Funds Distribution

City of Courtenay Policy

Section: 5 - Finance	Policy # 1850.00.04
Subject: Provision of Grant-in-Aid and other Forms of Financial Support	Revision #

PURPOSE:

The purpose of this policy is for Council to provide criteria to identify the appropriateness and suitability of applications from organizations requesting Grants-in-Aid and other forms of financial support from the City of Courtenay. Council decisions with respect to the provision of these forms of support will be made after carefully reviewing all applications and in conjunction with annual budgetary planning.

POLICY:

The City has limited financial resources available for the provision of Grants-in-Aid or other forms of financial support to special interest groups. In order to be consistent and fair to all applicants, the following criteria must be met:

1. **Entity must complete the Application and provide correspondence to City Council:**
   - **a. identifying who they are and whether they are a "for-profit" or "not-for-profit" organization,**
   - **b. what special interest they represent and a demonstrated financial need,**
   - **c. how much grant-in-aid or other financial commitments from the City they are requesting,**
   - **d. describe what project the resources will be used for,**
   - **e. describe how the project will benefit the community of the City of Courtenay and the greater Comox Valley region,**
   - **f. provide the project business case in terms of confirmation of need and demand, project sustainability, capital budget plan and operating budget plan if applicable, *(exclude if request is below $10,000),***
   - **g. provide the organization's audited financial statements for the past three years, *(provide prior year financial information if request is below $10,000),***
   - **h. identify projects in the Comox Valley they have successfully completed, *(exclude if request is below $10,000),***
   - **i. identify whether they are receiving or soliciting any other form of supplementary City funding, subsidy or fee reductions relative to the application;**
   - **j. identify other requests or receipt of funding from other organizations and Comox Valley local governments; and,**
   - **k. identify what City support they have received in the past five years and how it has been used.**

AUTHORIZATION:	DATE:

Section: 5 - Finance	**Policy # 1850.00.04**
Subject: Provision of Grant-in-Aid and other Forms of Financial Support	**Revision #**

2. Organizations must be based in the City of Courtenay. Funding is **not** available for individuals.

3. Organizations must identify and provide proof of supplementary funding payments or agreements from external sources supporting their initiative. Provincial and Federal funding agreements or correspondence identifying dollar amounts must be provided for Council information.

4. A Council resolution must authorize and determine the grant in aid payment or any other financial commitment from the City.

5. Grants-in-Aid and other commitments must be used for the purpose intended. City resources cannot be used to provide any type of assistance to other organization(s) working in tandem with the applicant.

6. Payments will only be issued upon direction provided by the Chief Administrative Officer or Director of Finance.

7. **Gaming Funds will be the primary funding source for all monetary commitments to organizations or entities requesting assistance.**

8. Grants or other City resources cannot be used for illegal purposes or anything disallowed by the Community Charter.

9. Applicants must publicly acknowledge the City of Courtenay's contribution.

10. Applications must be submitted by **August 1st of each year**, to the Director of Finance using the prescribed application form. The Director will review the applications for completeness and arrange contact with applicants for additional information as necessary.

11. The Director of Finance will present a summary report of the applications, relative to the eligibility criteria, to Council and arrange for delegations to Council as necessary.

12. Within one year of the date of receipt of the grant, entities must provide an independent reporting of how the grant was utilized and the outcomes of the dollars received.

AUTHORIZATION:	**DATE:**

Section: 5 - Finance	**Policy # 1850.00.04**
Subject: Provision of Grant-in-Aid and other Forms of Financial Support	**Revision #**

13. Grants-in-Aid shall be considered on a year-to-year basis and continuing support should not be anticipated.

SCOPE:

This policy applies to all grant-in-aid and financial requests submitted to the City of Courtenay. Authority for, and restrictions on the provision of, any form of assistance is provided under The Community Charter, Sections 8(1), 24 and 25. Preference will be given to organizations who can demonstrate a request that promotes the City's strategic priorities as identified in the Strategic Priorities found on the City's webpage.

RELATED DOCUMENTS:

RESPONSIBILITY:

City of Courtenay council members are responsible for adopting policies that manage the financial resources of the community. These policies must recognize the budgetary demands of City operations as a whole and be responsive to public perceptions and constraints. There is a limited sum of tax dollars and external revenue sources available for grants to organizations.

The Chief Administrative Officer or Director of Finance has responsibility for processing all payments.

REVIEW DATE:

This policy has an intended life of 20 years, or less dependent on the discretion of Council of-the-day.

AUTHORIZATION:	**DATE:**

List of Grant-In-Aid Applicants for 2019

Category	Name of Organization / Society	Purpose	Grant Requested for 2019	Grant approved by Council for 2018 *	Number of criterias fulfilled (0 - 4)	Recommended Grant Amount ($15,000 cap)	Recommended Grant Amount (no cap)
Downtown Arts & Culture	Comox Valley Multicultural & Immigrant Support Society	$1,200 Lunar Fest Celebration, $1,500 CV Multicultural Fest, $800 Children after school program and $300 Family sport program	$ 3,800	$ 3,500	4	$ 3,800	$ 3,800
	Comox Valley Arts	$20,000 - Operations, $33,200 - General Programming	$ 53,200	$ 13,000	4	$ 15,000	$ 53,200
	Comox Valley Pipe Band Society (CVPBS)	Classroom rental (SD71) - Sept to June - 2 nights/week. In-kind donation for facility rental to practice at would be considered.	$ 1,000	$ -	4	$ 1,000	$ 1,000
	Downtown Courtenay Business Improvement Associati	$5,000 to support community events (Moonlight Magic, Market Day and Summer Night Markets); $10,000 for Historical Art Installation Project	$ 15,000	$ -	3	$ 15,000	$ 15,000
	Western Canada Pulp and Paper Curling Bonspiel	2019 Pulp and Paper Annual Curling Bonspiel to be held at Comox Valley Curling Club March 7 to 10, 2019	$ 2,000	$ -	3	$ 2,000	$ 2,000
	The Alberni Project Society	$3,000 Summer Exhibit 'Graphic Art in Time of War' or 'Hide & Seek: Espionage & The Cold War' and $500 April 2019 Anzac Day (at HMCS Quadra in Comox)	$ 3,500	$ -	3	$ 3,500	$ 3,500
Downtown Arts & Culture Total			**$ 78,500**	**$ 16,500**	**4**	**$ 40,300**	**$ 78,500**
Green Capital Projects/Innovations	Comox Valley Land Trust	Funding for CV Conservation Partnership Program Coordinator	$ 8,000	$ 4,800	4	$ 8,000	$ 8,000
	Comox Valley Nature	Wetlands Restoration Projects : control & replacement of invasive plants	$ 3,000	$ 2,900	4	$ 3,000	$ 3,000
	Morrison Creek Streamkeepers	$1,850 Interpretive Signs at Puntledge Park, $700 Volunteer equipment / support for invasive plant removal and native plant planting	$ 2,550	$ -	3	$ 2,550	$ 2,550
	Youth and Ecological Restoration Program (YER)	Assistance with the YER video (promotional material) and YER website upgrade	$ 2,000	$ -	3	$ 2,000	$ 2,000
	Comox Valley Project Watershed Society	Awareness campaign to inform public of emerging issue with Canada goose increasing population, which threatens the health of local habitat	$ 2,500	$ 4,500	3	$ 2,500	$ 2,500
	Courtenay Lawn Bowling Club	Replacement of 18 rotting wooden benches	$ 15,000	$ -	1	$ -	$ -
Green Capital Projects/Innovations Total			**$ 33,050**	**$ 12,200**	**3**	**$ 18,050**	**$ 18,050**
Social/Societal Initiatives	Comox Valley Cycling Coalition (CVCCo)	$1,200 to develop, produce & distribute a cycling information card and $1,600 promotion on social media	$ 2,800	$ -	4	$ 2,800	$ 2,800
	Indigenous Women's Sharing Society	To support facility administration costs for ongoing non-funded admin activities	$ 5,000	$ 1,900	3	$ 5,000	$ 5,000
	LUSH Valley Food Action Society	Coordination of the Community Garden: $6,000 for Program coordinator, $1,000 material, $500 promo and $500 admin costs	$ 8,000	$ 5,100	2	$ 8,000	$ 8,000
	Comox Valley Transition Society (CVTS)	Assistance to cover reamining 60% of their 2019 property tax (CVTS is granted a 40% permissive tax exemption)	$ 6,000	$ 4,200	2	$ 6,000	$ 6,000
	The John Howard Society of North Island	KidStart one on one mentoring program	$ 7,500	$ -	2	$ 7,500	$ 7,500
	Comox Valley Transition Society (CVTS)on behalf of Comox Valley Coalition to End Homelessness (CVCEH)	Funding for continued programming	$ 8,000	$ 5,900	2	$ 8,000	$ 8,000
	Habitat for Humanity Vancouver Island North Society	Funds to go toward Lake Trail Road project	$ 30,000	$ 10,000	2	$ 15,000	$ 30,000
	Everybody Deserves a Smile Community Projects Societ	1,100 hand painted care packages for the homeless in the Comox Valley & other communities across the Island and beyond.	$ 5,000	$ -	1	$ -	$ -
	Royal Canadian Legion Branch #17	To replace upper lounge windows and frames in the local Branch	$ 10,774	$ -	1	$ -	$ -
Social/Societal Initiatives Total			**$ 83,074**	**$ 27,100**	**2**	**$ 52,300**	**$ 67,300**
Grand Total			**$ 194,624**	**$ 55,800**	**3**	**$ 110,650**	**$ 163,850**

* In 2018, a total of $84,000 has been granted to 14 organizations. Not all recipients reapplied for 2019.

City of Courtenay
2016 - 2018 Approved Schedule of Annual Gaming Funds Distribution

Distribution: Major Categories	Distributions -2016 Estimated Annual Funds Available	$ 875,000	Distributions -2017 Estimated Annual Funds Available	$ 885,000	Distributions -2018 Estimated Annual Funds Available	$ 895,000
Support Downtown Arts and Culture	CV Art Gallery	65,000	CV Art Gallery	65,000	CV Art Gallery	65,000
	Ctny & Dist Historical Society	50,000	Ctny & Dist Historical Society	50,000	Ctny & Dist Historical Society	50,000
	Sid Williams Theatre Society	105,000	Sid Williams Theatre Society	105,000	Sid Williams Theatre Society	105,000
	Downtown cultural events	5,000	Downtown cultural events	5,000	Downtown cultural events	5,000
		225,000		**225,000**		**225,000**
Council Initiatives & Projects	Purple ribbon Campaign	3,500	Purple ribbon Campaign	3,500	Purple ribbon Campaign	3,500
	Bus shelters - 3 per year	30,000	Bus shelters - 3 per year	30,000	Bus shelters - 3 per year	30,000
	Other projects and initiatives	41,500	Other projects and initiatives	41,500	Other projects and initiatives	41,500
		75,000		**75,000**		**75,000**
Public Safety / Security	Policing - fund two officers	**375,000**	Policing - fund two officers	**385,000**	Policing - fund two officers	**395,000**
Social / Societal Initiatives	Council supported supportive housing initiatives	**50,000**	Council supported supportive housing initiatives	**50,000**	Council supported supportive housing initiatives	**50,000**
Infrastructure Works	Reserve funds for third bridge	**100,000**	Reserve funds for third bridge	**100,000**	Reserve funds for third bridge	**100,000**
Green Capital Projects / Innovation	Council supported initiatives to achieve outcomes of reduced greenhouse gas emmissions, cleaner air, cleaner water	**50,000**	Council supported initiatives to achieve outcomes of reduced greenhouse gas emmissions, cleaner air, cleaner water	**50,000**	Council supported initiatives to achieve outcomes of reduced greenhouse gas emmissions, cleaner air, cleaner water	**50,000**
Total Annual Distribution		$ 875,000		$ 885,000		$ 895,000

THE CORPORATION OF THE CITY OF COURTENAY

STAFF REPORT

To: Council **File No.:** 1705-20 / 1830 - 05

From: Chief Administrative Officer **Date:** January 21, 2019

Subject: 2019 - 2023 MUNICIPAL SOLID WASTE, RECYCLABLES, AND YARD WASTE BUDGETS

PURPOSE:

The purpose of this report is to consider the 2019 - 2023 operating budget for Municipal Solid Waste (MSW) and to establish the applicable solid waste, recyclables, and yard waste user fees.

POLICY ANALYSIS:

Section 194 of the *Community Charter* allows Council to charge a user fee to cover the cost of delivery of a service.

EXECUTIVE SUMMARY:

The costs associated with providing solid waste, recyclables, and yard waste collection are reviewed annually and user fees are established to cover the projected cost to deliver the services in the upcoming year. These services are not funded from general property taxation. For 2019, a general user fee increase of 2% is required to ensure that the 2019 costs to deliver the service are fully covered.

CAO RECOMMENDATIONS:

That based on the January 21, 2019 staff report "2019 - 2023 Municipal Solid Waste, Recyclables, and Yard Waste User Budgets" Council approve OPTION 1 and increase 2019 user fees by 2%, and;

That Bylaw Number 2954,2019 a bylaw to amend the "City of Courtenay Fees and Charges Bylaw No. 1673, 1992", proceed to first, second and third reading in order to revise the proposed 2019 Municipal Solid Waste, Recyclables and Yard Waste user fees.

Respectfully submitted,

David Allen, BES, CLGEM, SCLGM
Chief Administrative Officer

BACKGROUND:

Council sets the Solid Waste user fee rate schedule by bylaw each year to ensure costs for the provision of solid waste, recyclables and yard waste collection services are fully recovered. These services are not funded from the general property taxation levy.

DISCUSSION:

The City provides weekly curb side pickup of Municipal Solid Waste (MSW) and yard waste, bi-weekly pickup of recyclables for residential properties, and scheduled MSW/cardboard pickup for commercial properties. The user fee charged for this service must cover:

1. The costs of the contractor engaged to provide MSW/recyclables collection and transport services.

   The increase in the cost of the solid waste and recyclables collection contract is calculated using an agreed to weighted formula between Consumer Price Index and the Price of Diesel in BC.

   Based on the latest price indexes available it is projected that fees payable to the contractor will increase by 4% in 2019.

2. The costs of regional landfill fees for disposal of mixed waste.

   Effective January 1, 2019, the regional landfill tipping fee will be $130 per tonne. (2018 $130 per tonne).

   Although the tipping fee will not increase in 2019, it is expected that volume into the landfill will increase with growth in the community. A 2% increase in volume is projected for 2019.

3. The internal costs to deliver the service

   Internal costs recovered include costs related to utility billing and collection, as well as of the administration of the service, and represents approximately 2% of the overall user fee.

<u>RecycleBC - Revenues</u>

The City recently signed a second five year contract with RecycleBC to provide recycling services to residential units in Courtenay. The City will continue to receive financial incentives through the program which covers the cost of providing the bi-weekly curb side pickup of recyclables to single and multi-family residences.

<u>2020 – 2023 Financial Plan:</u>

At the current service level, operating budget expenditures for 2020 – 2023 are projected to increase by about 3% annually based on population growth, building-development permit growth, and inflationary impacts. In order to ensure these cost increases are not a direct burden to the general tax base, it is projected that revenue generated from community growth of 0.5% and a user fee rate increase of 2.5% will provide revenues sufficient to offset the operating costs. However, these are estimations based on existing operational circumstances. Future rate adjustments may be needed based on updated information and changing requirements.

The City's agreement with the current solid waste contractor expired on November 30, 2018. The City initiated the 11 month extension mechanism by mutual agreement to allow for clarity on Organics collection and its impact on the collection service.

FINANCIAL IMPLICATIONS:

In order to provide the same level of service to customers in 2019, a 2.0% user fee rate increase is required. The general impact to customers will be:

1. Annual flat levy fee for residential and commercial will increase from $161.44 to $164.67, a difference of $3.23 per year;
2. Multi-family apartments and stratas (excluding yard waste) will increase from $141.83 to $144.67 a difference of $2.84 per year;
3. Additional service fee charges for extra yard waste pickup will change from $19.09 to $19.47, a difference of $0.38 per year.

Attachment number 1 identifies all applicable rate changes in comparison to 2018. As the new bylaw rates would become effective only on final adoption, projected to be early February, 2019, these rates that will be charged to customers are the product of a blend of 2018 and 2019 bylaw rates as illustrated below:

	2018 Bylaw Rate	2019 Bylaw Rate	**2019 Blended User Fee**	Impact	
Dwelling Basis Fee per unit per year					
- includes recyclables and yard waste pickup	$ 161.44	$ 165.01	**$ 164.67**	$ 3.23	**2%**

2020 – 2023 Financial Plan:

Attachment number 2 provides the proposed budget for 2020-2023 and includes an estimated 2.5% increase to user fees over the next four years to cover the costs of providing the service. This percentage increase is based on the existing operational circumstances therefore future rate adjustments may be necessary as circumstances change.

ADMINISTRATIVE IMPLICATIONS:

Staff will update the utility billing system and Financial Plan documentation to reflect the approved rates for 2019 once the amended bylaw is adopted. This will take approximately 3 hours.

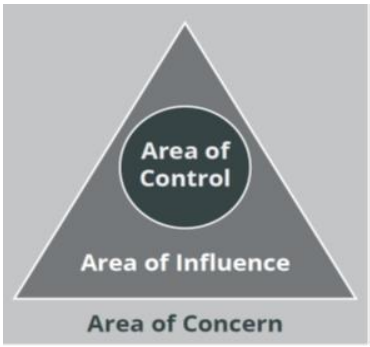
ASSET MANAGEMENT IMPLICATIONS:

Not applicable.

STRATEGIC PRIORITIES REFERENCE:

We focus on organizational and governance excellence

- We support and encourage initiatives to improve efficiencies
- We responsibly provide services at a level which the people we serve are willing to pay



- **Area of Control**
  The policy, works and programming matters that fall within Council's jurisdictional authority to act.
- **Area of Influence**
  Matters that fall within shared or agreed jurisdiction between Council and another government or party.
- **Area of Concern**
  Matters of interest outside Council's jurisdictional authority to act.

OFFICIAL COMMUNITY PLAN REFERENCE:

Section 6.5 Solid Waste

Policy: 1

1. The City will pursue steps to reduce solid waste through a variety of approaches including:
   - education, promotion, advertising
   - encouraging recycling
   - encouraging home composting
   - review user fees
   - supporting recycling facilities within major commercial and industrial developments
   - encouraging mandatory garbage collection for the Comox Valley

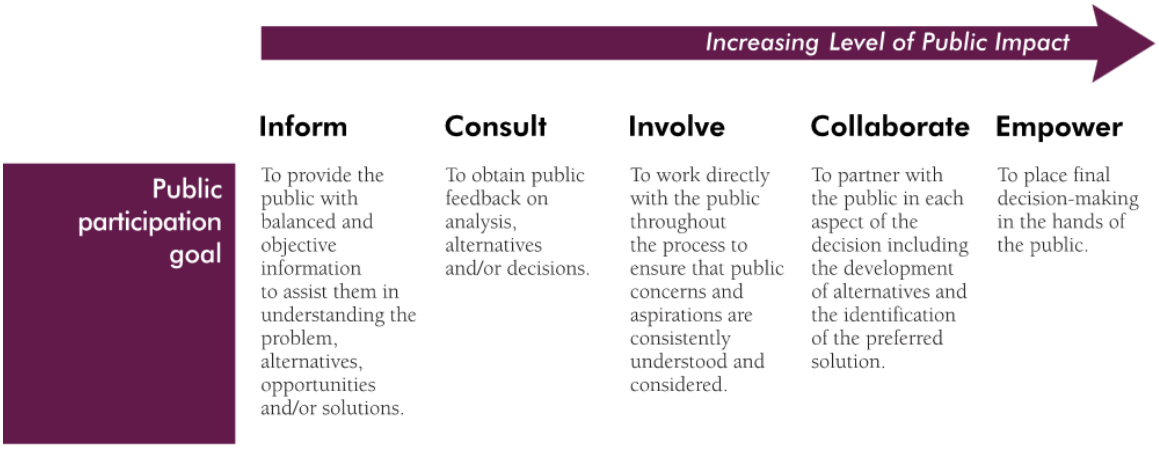
REGIONAL GROWTH STRATEGY REFERENCE:

Goal 8: Climate Change:
Objective 8-C: Reduce GHG emissions in the solid waste sector

CITIZEN/PUBLIC ENGAGEMENT:

Staff will **inform** the public based on the IAP2 Spectrum of Public Participation:

http://c.ymcdn.com/sites/www.iap2.org/resource/resmgr/imported/IAP2%20Spectrum_vertical.pdf



OPTIONS:

OPTION 1: That Council endorse the proposed increases to the Solid Waste, Recyclables, and Yard Waste user fees as outlined in the attached table of this report; and,

That Bylaw Number 2954,2019 a bylaw to amend the "City of Courtenay Fees and Charges Bylaw No. 1673, 1992", proceed to first, second and third reading to reflect the proposed 2019 Solid Waste, Recyclables and Yard Waste user fees.

OPTION 2: That Council defer endorsing the proposed increase to the 2019 Solid Waste, Recyclables and Yard Waste user fees for further discussion at a later Council meeting.

While Option 2 provides time for further discussion, it also impacts the schedule required for the 2019 Budget process.

OPTION 3: That Council leave all Solid Waste, Recycling and Yard Waste user rates unchanged for 2019.

While Option 3 provides reduced user fees to the public, the City is still committed to making payments to our contractor and the Comox Valley Regional District, therefore a deficit would occur that may negatively impact future years' user fees and services provided.

Prepared by:

Jennifer Nelson, CPA, CGA
Director of Financial Services

Attachments:

1: 2019 Solid Waste and Recycling User Fee Collection Rates
2: 2019 – 2023 Solid Waste, Recycling and Yard Waste Financial Plan Summary

SOLID WASTE + RECYCLING COLLECTION FEES					2018 Approved Rates	2019 Proposed Rates	Change
a) Dwelling Basis Fee (included recycling & yard waste)					$ 161.44	$ 164.67	$ 3.23
Extra Bag Ticket (50 litre) As of March 7					$ 2.50	$ 2.50	$ -
b) Multifamily, Apt, Strata per unit (no blue box, no recyling)					$ 141.83	$ 144.67	$ 2.84
	a) Recycling Pick Up per unit				$ -		$ -
	b) Yard Waste Pick Up per unit				$ 19.09	$ 19.47	$ 0.38
c) Trade Premises - per Pick Up					$ -	$ -	$ -
Cans	1 Can or Equivalent				$ 2.80	$ 2.86	$ 0.06
	Each Extra Can				$ 2.80	$ 2.86	$ 0.06
DCBIA - Per Unit Per Year					$ 308.97	$ 315.15	$ 6.18
Containers - Mixed Per Pick Up		**Calculated Rates**					
Bins	2 Yd^3	Base Rate			$ 16.81	$ 17.15	$ 0.34
	3 Yd^3	2 yd3 mixed container base rate X	1.5		$ 25.22	$ 25.73	$ 0.51
	6 Yd^3	2 yd3 mixed container base rate X	3		$ 50.43	$ 51.45	$ 1.02
	12 Yd^3	2 yd3 mixed container base rate X	6		$ 100.86	$ 102.90	$ 2.04
	20 Yd^3	2 yd3 mixed container base rate X	10		$ 168.10	$ 171.50	$ 3.40
	***Sizes other than listed above charged at a rate per cubic yard				**$ 8.41**	**$ 8.58**	$ 0.17
Compactors - Mixed Per Pick Up							
Bins	27 Yd^3	Base Rate			$ 454.30	$ 463.39	$ 9.09
	28 Yd^3	27 yd3 compactor Base Rate +	1	2 yd3 mixed bins container rate	$ 471.11	$ 480.54	$ 9.43
	30 Yd^3	27 yd3 compactor Base Rate +	3	2 yd3 mixed bins container rate	$ 504.73	$ 514.84	$ 10.11
	35 Yd^3	27 yd3 compactor Base Rate +	8	2 yd3 mixed bins container rate	$ 588.78	$ 600.59	$ 11.81
	40 Yd^3	27 yd3 compactor Base Rate +	13	2 yd3 mixed bins container rate	$ 672.83	$ 686.34	$ 13.51
	***Sizes other than listed above charged the Applicable Year's 27 cubic yard base rate plus multiple of 2 cubic yard base rate				**$ 16.81**	**$ 17.15**	$ 0.34
Containers - Cardboard Per Pick Up							
Bins	2 Yd^3	Base Rate			$ 9.20	$ 9.38	$ 0.18
	3 Yd^3	2 yd3 containers-cardboard Base rate x	1.5		$ 13.80	$ 14.07	$ 0.27
	6 Yd^3	2 yd3 containers-cardboard Base rate x	3		$ 27.60	$ 28.14	$ 0.54
	***Sizes other than listed above charged at a rate per cubic yard				$ 4.60	$ 4.69	$ 0.09
Compactors - Cardboard Per Pick Up							
Bins	27 Yd^3	Base Rate			$ 151.48	$ 154.51	$ 3.03
	30 Yd^3	2 yd3 mixed container base rate X	1	plus Compactors Cardboard base rate	$ 168.29	$ 171.66	$ 3.37
	35 Yd^3	2 yd3 mixed container base rate X	2.67	plus Compactors Cardboard base rate	$ 196.36	$ 200.30	$ 3.94
	40 Yd^3	2 yd3 mixed container base rate X	4.34	plus Compactors Cardboard base rate	$ 224.44	$ 228.94	$ 4.51
	***Sizes other than listed above charged the Applicable Year's 27 cubic yard base rate plus multiple of 2 cubic yard base rate				$ 5.61	$ 5.72	$ 0.11

City of Courtenay
2019 - 2023 Five Year Financial Plan

Solid Waste Summary	Final Budget	Proposed Budgets for Discussion			
	2019	2020	2021	2022	2023
REVENUES					
Garbage Collection	2,999,100	3,088,000	3,180,800	3,276,200	3,373,400
RecycleBC Revenue	355,000	355,000	355,000	355,000	355,000
RecycleBC Eductaion Grant	30,000	30,000	30,000	30,000	30,000
Total Revenues	**3,384,100**	**3,473,000**	**3,565,800**	**3,661,200**	**3,758,400**
EXPENDITURES					
OPERATING					
Collection Services					
General Services - Emterra	1,682,900	1,733,400	1,768,100	1,803,400	1,839,500
CVRD Services	1,407,000	1,490,300	1,550,500	1,613,100	1,678,300
Advertising	42,000	32,000	32,000	32,000	32,000
Sub-Total	3,131,900	3,255,700	3,350,600	3,448,500	3,549,800
Dog Stations	28,200	28,500	28,700	29,100	29,300
Miscellaneous	6,500	6,500	6,500	6,600	6,600
Litter Baskets - City Crew	130,100	95,000	95,900	96,900	97,900
Sub-Total	164,800	130,000	131,100	132,600	133,800
Total Operating Expenses	**3,296,700**	**3,385,700**	**3,481,700**	**3,581,100**	**3,683,600**
ADMINISTRATIVE / Staff Recovery					
Finance Clerk Wage Recovery	71,800	73,200	74,700	76,200	77,700
Postage, Billing Cycles	5,000	5,100	5,200	5,300	5,400
Total Administrative Expenses	76,800	78,300	79,900	81,500	83,100
Total Expenditures	**3,373,500**	**3,464,000**	**3,561,600**	**3,662,600**	**3,766,700**
Net Suplus (Deficit)	**10,600**	**9,000**	**4,200**	**(1,400)**	**(8,300)**

THE CORPORATION OF THE CITY OF COURTENAY

BRIEFING NOTE

To: Council **File No.:** 0540-02

From: Chief Administrative Officer **Date:** January 11, 2019

Subject: **2019 Council Orientation Series - Capital Borrowing; Air Quality; LED Streetlights; and Speed and Safety Issues**

ISSUE:

The purpose of this Briefing Note series is to provide high-level responses to questions posed by individual council members' in an open fashion for the benefit of all council members and the public.

(A Briefing Note is a non-confidential internal instrument used to provide written, recorded and filed staff support to one or more elected officials. It is a one-way, timely communication that does not contain advice, opinions or speculation. Its content is made public by its attachment to the next forthcoming Council Agenda and may be raised for Council collective discussion at that time).

BACKGROUND:

The questions/issues posed in this instance were:

1. Capital Borrowing – looking for a better understanding of how borrowing costs and limitations etc.
2. Air quality – background from a council perspective
3. LED streetlights – is this in the works? New neighbourhoods & replacement?
4. Speed & Safety issues on 1st St.

KEY CONSIDERATIONS:

Brief responses are as follows:

1. Capital Borrowing

The City's allowable debt servicing cost is calculated annually by the Ministry and is based on 25% of certain revenue streams from the previous year. The City's annual limit as of December 31, 2017 (Audited) is currently calculated at 11.7 M/year (allowable interest expense related to debt). The City is currently at $1.6M. We have only used about 14% of our allowable borrowing room. The City currently has approximately $13M of outstanding debt as of Dec 31, 2017 (Audited).

Borrowing is typically used strategically to finance infrastructure work, construction/renovation of civic buildings, and to meet transportation requirements. There is quite a lengthy process in order to borrow funds that is governed by the Community Charter and Local Government Act, that can take 6-8 months and includes approval from the Province. All funds are borrowed through the Municipal Finance Authority, which has a good website that offers flowcharts of the entire process, as well as the latest borrowing rates for different terms of borrowing: https://mfa.bc.ca/

Costs related to principle and interest payments on outstanding debt are generally recovered through taxation, therefore spreading the cost burden to the users of the asset out over the term of the debt.

The City has historically borrowed for 15 or 20 year terms. A detailed list of our outstanding debt can be found in the annual report on page 54:
https://www.courtenay.ca/assets/City~Hall/Annual~Reports/Courtenay-Annual-Report-2017.pdf

More information is available in the "UBCM Fact Sheet #12" included in the Council Orientation package.

2. Air Quality

The first thing for a council member to understand is the airshed is shared by the four regional communities, so seeking a shared solution would be a far more efficient than pursuing a collection of redundant solutions. Of note, the CVRD CAO has prepared a staff report for the January 15th CVRD Committee of the Whole that recommends formation of Regional Airshed Advisory Group to consult on regional air quality initiatives and potential solutions and report back to the Board by spring of 2019.

Second, it is necessary to understand the various forms of particulate matter and their sources before a sensible solutions can be identified. See the attached study (Executive Summary and Table 1) and pay particular attention to the PM2.5 data. Note, for example, that more than half of the PM2.5 particulate matter (dust) in the Valley comes from paved and unpaved roads and nearly a quarter of the total comes from provincially regulated slash burning. Less than 1/5 comes from space heating from wood and, in a recent survey by the Ministry of the Environment, 93% of the respondents who use wood as their primary heating source have a wood burning appliance that already meets emissions certifications.

Third, the majority of our air quality problems result from activities within the exclusive domain of the provincial government. Therefore, as has often been done in the past, local government advocacy via the UBCM for provincial government solutions remains the correct action to resolve the bulk of the problem.

Fourth, local solutions should and do focus on space heating from wood, but not within a regulatory standards scheme because that is the domain of both the federal and provincial governments. The most effective local government activities are woodstove upgrade grants and teaching the proper seasoning of wood fuel (the CVRD already has region-wide programs for exactly these two things – see: https://www.comoxvalleyrd.ca/services/environment/air-quality) It is possible to take more aggressive street cleaning actions within our own jurisdictions, however, this is only a partial solution since most road area within the Valley is under provincial government jurisdiction. Also, each local government in the Valley may prohibit new installations of woodstoves altogether by all four adopting similar bylaws to so specify.

Therefore, overall, we must first understand the problem, then we may take actions where we can and where we can't, we may advocate for solutions as applicable.

3. LED Streetlights

LED streetlights are installed in all our new developments (Department of Development Services).

Public Works Services installs LEDs through attrition (i.e. failed high pressure sodium) in existing streetlights – typically through public inquiries.

It is intended that BC Hydro grants and general revenue will be used to fund a multi-year full conversion program beginning in the 2020 budget. Asset Management Technical Services completed a City-wide inventory and condition assessment of existing streetlights during 2018 in support of this initiative.

Parks and Walkways ornamental lights and Civic Properties building exterior fixtures are being converted to LED through an annual operational program with approximately 30% already completed. Climate Action Revenue Incentive Program rebates (CARIP) provide the funding.

4. Speed & Safety – 1st St.

The area of concern is 1st street starting from the Menzies Avenue corner/hill to Powerhouse Road (City Boundary).

This is an exceptionally long and straight residential Collector with a two-way single lane (4kms) to Arden Road then a slight bend to Powerhouse Road.

This has a default Municipal 50km zone with one 30Km playground zone (Puntledge Park). Currently there exists a truck size limitation of 5500Kg (posted, but not enforceable). To date Public Works Services has received no traffic related inquiries about speed, however there have been requests for traffic calming at the Puntledge Playground.

For 2019, Public works is planning to install (pending approved operational budget) some minor traffic calming (solar powered X-walk lights and pedestrian refuges/islands) measures to increased pedestrian safety.

The Transportation Master Plan will also identify this corridor as a major link.

Respectfully submitted,

David Allen, BES, CLGEM, SCLGM
Chief Administrative Officer

Attachment:

1. *Comox Valley 2017 Particulate Matter Inventory - Final Report*

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CONSULTING ENGINEERS & SCIENTISTS

CANADA'S BEST MANAGED COMPANIES Platinum member

Particulate Matter Emissions Inventory for the Comox Valley 2015 Base Year

Final Report

RWDI # 1700243
March 17, 2017

SUBMITTED TO

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EXECUTIVE SUMMARY

RWDI AIR Inc. (RWDI) was retained by the BC Ministry of Environment (BC MOE) to compile a Particulate Matter (PM) emissions inventory for the Comox Valley Regional District (CVRD). In this report, RWDI presents an inventory of particulate matter emissions including total particulate matter (TPM), particulate matter 10 microns and smaller in aerodynamic diameter (PM_{10}) and particulate matter 2.5 microns and smaller in aerodynamic diameter ($PM_{2.5}$) for a 2015 Base year. Emissions were quantified from point (industrial), area, and mobile sources as well as road dust. Specific focus was placed on wood combustion in various forms, including: residential woodstoves for space heating; residential yard waste; shrubs and trees from land-clearing; and, forest harvesting slash burning.

Total PM, PM_{10}, and $PM_{2.5}$ in the CVRD are estimated to be 875, 707, and 592 tonnes, respectively, excluding road dust. Emissions of TPM, PM_{10}, and $PM_{2.5}$ by source and source sector are shown in Table 1.

Fugitive road dust is estimated to contribute 92% of the total PM, 78% of the PM_{10}, and 46% of the $PM_{2.5}$ in the region. However, most fugitive road dust is in the coarse (>44 µm) size fraction (Pace, 2005) and thus settles out of the air in close proximity (e.g., meters to tens of meters) to the emission source (Desert Research Institute, 2000).

When excluding road dust sources from the emission summary, the key sources of TPM in the region are open burning (48%), and space heating (25%), followed by agricultural (10%) and mobile (9%) sources. Industrial sources make up less than 1% of the TPM in the region. Emissions of PM_{10} follow similar patterns to TPM in the CVRD. There are more significant differences in the contribution from different source types to $PM_{2.5}$ emissions. Dominant sources of $PM_{2.5}$ in the region are open burning (45%), space heating (35%), and mobile sources (12%).

Table 1: Particulate Matter Emissions for the CVRD

Emission Source			2015 Emissions (tonnes per year)		
			TPM	PM_{10}	$PM_{2.5}$
Point	Industrial Sources		1.6	0.6	0.2
	Point Subtotal		***1.6***	***0.6***	***0.2***
Area	Space Heating	Natural Gas - Residential	1.2	1.2	1.2
		Natural Gas - Commercial/Industrial	1.0	1.0	1.0
		Propane	0.2	0.2	0.2
		Wood	225.6	213.0	212.8
		Heating Oil	0.5	0.5	0.5
		Space Heating Subtotal	***228.5***	***215.9***	***215.7***
	Agricultural	Synthetic Fertilizer Application	0.2	0.1	0.03
		Tilling	35.5	35.5	7.5
		Harvesting	0.3	0.3	0.05
		Wind Erosion	51.1	25.6	3.8
		Livestock movements	4.1	1.2	0.2
		Crop Residue Burning	0.9	0.8	0.8
		Agricultural Subtotal	***92.1***	***63.6***	***12.4***
	Open Burning	Provincially Regulated – Pile	348.9	247.8	215.9
		Provincially Regulated – Area	57.5	42.4	36.7
		Municipally Regulated – Pile	6.2	4.8	4.1
		Recreational Fires	0.01	0.01	0.009
		Regional/Municipal - Backyard Burns	17.2	17.2	17.2
		Wildfire	3.5	2.6	2.4
		Open Burning Subtotal	***433.4***	***314.8***	***276.2***
	Miscellaneous	Meat Cooking	15.5	15.5	15.5
		Cigarettes	0.5	0.5	0.5
		Dry Cleaning	0.01	0.01	0.01
		Crematorium	0.01	0.01	0.01
		Structural Fires	0.3	0.3	0.3
		Miscellaneous Subtotal	***16.4***	***16.4***	***16.4***
	Area subtotal		***770.3***	***610.7***	***520.7***
Mobile	On-road	Light-duty	11.6	11.6	10.8
		Heavy-duty vehicles	10.4	10.4	10.0
	Non-road vehicles		34.1	33.7	32.6
	Marine Vessels		19.4	19.4	17.8
	Aircraft		3.3	3.3	3.0
	Mobile Subtotal		***78.7***	***78.3***	***74.1***
Fugitive Dust	Industrial Sources		3.7	1.1	0.1
	Construction Operations		23.3	23.3	4.7
	Landfills		22.8	12.6	8.4
	Fugitive Dust Subtotal		***49.8***	***36.9***	***13.1***
Total (no road dust)			***900.5***	***726.5***	***608.1***
Paved and unpaved roads			11,087.3	2,615.9	522.6
Total (with Road dust)			***11,987.8***	***3,342.4***	***1,130.7***

Notes: Totals may not equal the sum of components due to rounding.

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1 INTRODUCTION

The BC Ministry of Environment (BC MOE) retained RWDI AIR Inc. (RWDI) to provide an air emissions inventory of particulate matter (PM) in the Comox Valley Regional District (CVRD). This region encompasses the City of Courtenay, the Town of Comox, Village of Cumberland, CVRD Areas A, B and C, and all First Nations within these geographic areas. The PM inventory included all relevant emission sources in the region including point, area, and mobile sources as well as road dust for the Base Year 2015. Emissions were computed for total particulate matter (TPM), particulate matter 10 microns and smaller in aerodynamic diameter (PM_{10}) and particulate matter 2.5 microns and smaller in aerodynamic diameter ($PM_{2.5}$).

There is very little industry in the Comox Valley. The emissions inventory therefore focused on developing robust estimates from the area source category. Specific focus was placed on wood combustion in various forms, including: residential woodstoves for space heating; residential yard waste, shrubs and trees from land-clearing; and, forest harvesting slash burning.

2 PARTICULATE MATTER EMISSIONS ESTIMATION METHODS

Particulate matter emissions in the CVRD arise from industrial, mobile and area sources as well as road dust.

Industrial facilities in the CVRD include the following:

- Cement facilities;
- Concrete facilities; and
- Asphalt facilities.

Area sources include the following:

- Space heating;
- Open burning;
- Agricultural activities; and
- Miscellaneous sources.

Agricultural area sources include:

- Wind erosion and tilling of soils;
- Harvesting of crops;
- Agricultural open burning;
- Dust from livestock; and
- Synthetic fertilizer application.

Open burning sources include:

- Burning activities regulated and tracked (through permit or other means) by provincial and local authorities; and
- Wildfires that are not deliberately set.

Mobile sources of PM include:

- On-road vehicles;
- Off-road vehicles;
- Aircraft;
- Marine vessels; and,
- Rail sources.

Typically, emissions are expressed as a base quantity or 'activity' multiplied by an emission factor. The accuracy of the calculation thus hinges on both the accuracy of the base quantity data available and the latest scientific data to support the emission factors. A general emission equation is shown below.

$$Emissions = Base\ Quantity \times Emission\ Factor$$

The specific emission equations, base quantities and emission factors used for each of the emission sources are listed in the sections below.

2.1 Industrial Sources

A search of BC MOE emission database revealed that three facilities had air discharge authorization for PM in the CVRD. Two of these facilities (Trueline Masonry and Landscape Products Ltd. and Hyland Precast Inc.) are cement and concrete manufacturing plants. one facility (Tayco Paving Co. Ltd) is an asphalt manufacturing plant.

Both Trueline Masonry and Landscape Products Ltd. and Hyland Precast Inc. only had allowable discharges for TPM. As no additional information was available for the $PM_{2.5}$ and PM_{10} fractions, only TPM is presented for these facilities. Tayco Paving reported air releases of PM to the 2014 National Pollutant Release Inventory (NPRI) from stack, storage and handling, fugitive, and road dust sources. For consistency with the rest of this report, the fugitive dust from roads from this facility are presented separately from the other industrial point source emissions. As the actual emissions for the other two facilities were not available, a conservative estimate was calculated using the maximum allowable discharges from their permits. The TPM emissions from industrial sources in the BC MOE authorization database and reported to the NPRI in 2014 are shown in Table 2.

Table 2: Particulate Matter Emissions from Industrial Sources in the Authorization Database and Reported to the NPRI in 2014 (tonnes per year)

Emission Source		2014 Emissions (tonnes per year)		
		TPM	PM_{10}	$PM_{2.5}$
Point	Tayco Paving Company	1.51	0.65	0.23
	Trueline Masonry and Landscape Products Ltd.	0.01	-	-
	Hyland Precast Inc.	0.07	-	-
	Point subtotal	***1.59***	***0.65***	***0.23***
Fugitive Dust	Industrial Sources Tayco Paving Company	3.74	1.06	0.11
	Fugitive Dust subtotal	***3.74***	***1.06***	***0.11***
Total		***5.33***	***1.71***	***0.34***

2.2 Area Sources

Area sources within the CVRD include space heating, agricultural sources, and open burning. Particular attention was given to developing estimates of emissions from residential woodstoves, residential and agricultural backyard burning, and land-clearing burning.

2.2.1 Space Heating

Particulate emissions from space heating result from the combustion of natural gas, propane, heating oil or wood for residential, commercial and industrial buildings. The Community Energy and Emissions Inventory of CEEI (Ministry of Environment, February 2014) estimates the energy use and greenhouse gas emissions from residential, commercial and industrial buildings by community. The CEEI directly obtains natural gas, propane (for some regions) and electricity data from the major utilities. Total consumption is estimated by region using the number of dwellings and average consumption by dwelling type. The consumption of heating oil, propane, and wood is estimated from the difference of the expected total energy consumption minus the actual reported by natural gas and electricity and piped propane utility providers. The latest CEEI report for 2010 was used for the space heating calculations. In addition, RWDI conducted a phone and email survey to collect sales volumes of propane, heating oil and wood used in residential and commercial/industrial space heating in the CVRD. Information on the data collection from fuel suppliers is discussed in the sections below.

2.2.1.1 Natural Gas Consumption

The CEEI obtains natural gas usage directly from utility providers. The values for residential and commercial consumption in the CVRD from the 2010 CEEI report were used. These values were then multiplied by the natural gas heating value (1,050 BTU/ft^3) from AP-42 Appendix A (US EPA, 1995) and the TPM emission factor from AP-42 Chapter 1, Section 4 on Natural Gas Combustion (US EPA, 1998). The amount of natural gas consumed and the relevant emission factors are listed in Table 3. All particulate matter from natural gas combustion is assumed to be less than 1.0 micron, consistent with the guidance from AP-42.

Table 3: Particulate Matter Emissions from Natural Gas Combustion (tonnes per year)

Building Type	Usage (GJ)	Emission Factor (kg/GJ)		
		TPM	PM_{10}	$PM_{2.5}$
Residential	379,654	0.0031		
Commercial	309,409			

2.2.1.2 Propane Consumption

RWDI attempted to contact five propane companies in the CVRD by phone and email. Two were distributors and three were suppliers. Of these, two did not respond and two declined to provide information. However, one provider who did not provide data (claiming confidentiality issues) confirmed that sales have remained constant over the last few years. They also confirmed that the 2010 CEEI consumption value for the CVRD was still a reasonable estimate for 2015.

The amount of propane from the 2010 CEEI report was multiplied by the propane heating value (94,000 BTU/gal) from AP-42 Appendix A (US EPA, 1995) and the TPM emission factor for commercial boilers from AP-42 Chapter 1, Section 5 on Liquefied Petroleum Gas Combustion (US EPA, 2008). Only a TPM emission factor was published; however, all the PM is assumed to be less than 1.0 µm. Emission factors from propane combustion are listed in Table 4.

Table 4: Particulate Matter Emissions from Propane Combustion (tonnes per year)

Boiler Type	Usage		Emission Factor ($kg/10^3$ L)		
	(GJ)	(L)	TPM	PM_{10}	$PM_{2.5}$
Commercial	71,153	2,717,742	0.084		

2.2.1.3 Heating Oil Consumption

RWDI attempted to contact two furnace oil providers in the CVRD. Emails were sent to both companies; however, neither responded. To calculate emissions from heating oil, the 2010 CEEI consumption value was multiplied by the distillate oil (No. 2 oil) heating value (140,000 BTU/gal) from AP-42 Appendix A (US EPA, 1995) and filterable PM emission factor for residential furnaces from AP-42 Chapter 1, Section 3 on Fuel Oil Combustion (US EPA, 1999). All PM was assumed to be less than 2.5 microns in diameter. Emission factors from heating oil combustion are listed in Table 5.

Table 5: Particulate Matter Emissions from Heating Oil Combustion (tonnes per year)

Firing Configuration	Usage		Emission Factor (kg/1000L)		
	(GJ)	(L)	TPM	PM_{10}	$PM_{2.5}$
Residential Furnace	412,618	10,581,884	0.048		

2.2.1.4 Residential Wood Burning

Prior research and monitoring efforts in the Comox Valley have suggested that residential wood burning is a considerable source of PM in the CVRD. As with all sources, the emission estimates are only as good as the quality of the base quantity data available. Unfortunately, unlike other fuel sources, consumption of wood is difficult to track accurately. Retail suppliers have no requirement to track or report volumes sold, and as there are a limited number of suppliers they are not inclined to share proprietary information publically. In addition, wood is freely available from many local and untraceable sources.

There are a few documents which can provide some information to help to quantify the amount of wood consumed in the CVRD as listed below.

- The 2010 Community Energy and Emissions Inventory (CEEI) (Ministry of Environment, February 2014)
- An Inventory of Wood-burning Appliance Use in British Columbia (Mustel Group Market Research, March 2012)
- Residential Wood-Burning Emissions in British Columbia (BC Ministry of Water, Land, and Air Protection (WLAP), May 2005)
- Wood Stove Inventory and Behaviour Analysis (Envirochem Services Inc., December 2012)

The first three reports all provide different methodologies and different values which can be used to calculate the wood consumed in the CVRD. A methodology to calculate the wood consumption using data from each of the first three reports is provided below along with a comparison of the results and presentation of the final approach used to calculate emissions. The fourth document is a summary of all residential burning surveys completed in BC to date (at the time of writing).

The 2010 CEEI (Ministry of Environment, February 2014) estimated the amount of heating oil, delivered propane and wood used for space heating in the CVRD by assuming average fuel consumption amounts by dwelling type and number of dwellings and subtracting the use of electricity, natural gas, and piped propane in the region. The CEEI estimated that 494,412 gigajoules of energy was obtained from wood in the CVRD.

The energy consumed in the CEEI was provided in gigajoules and was converted to tonnes of wood using Equation 1 and assuming a moisture content (MC) of 18% as per the Residential Wood Burning Report (WLAP, 2004)

Equation 1: Wood Consumption Conversion (from gigajoules to tonnes)

$$Wood\ Consumed\ (tonne) = Energy\ from\ Wood\ Consuption\ (GJ) \div \left(19.2 - \ (0.2164 \times MC)\right)$$

The quantity of wood consumed in 2010 using the CEEI as a raw data source is shown in Table 6 and Figure 1.

The BC MOE retained the Mustel Group to conduct a telephone survey of wood burning appliance use in BC in 2012 (Mustel Group Market Research, March 2012). The results from this survey included a detailed breakout of the number of survey respondents who use a wood burning appliance for a number of regions across BC. It was found that 20% of survey respondents in the Comox Valley use wood appliances, and 36% of the respondents in the entire "West Coast Region" (equivalent to Vancouver Island outside of other communities surveyed) use wood appliances. The report also collected information on the percentage splits of four major appliance types: wood stoves (63%); wood fireplaces (45%); wood burning central heat (3%); and, pellet stoves (5%). The Mustel Group also collected information on the amount of wood and pellets burned annually by household. BC statistics reports 29,231 households in the CVRD in 2015. The quantity of pellets and wood used in 2015 were estimated from the data in the Mustel Group report and are shown in Table 6 and Figure 1.

The British Columbia Ministry of Water, Land and Air Protection (WLAP) (BC Ministry of Water, Land, and Air Protection (WLAP), May 2005) completed a detailed emissions inventory for PM from wood burning equipment across the province in 2004. The WLAP report included a telephone survey of wood burning appliance use in British Columbia. The WLAP report used the survey results to quantify the amount of wood (and wood pellets) burned in each of 12 types of appliances for two regions on Vancouver Island: the Capital Regional District, and Other Vancouver Island. The total number of households in the Other Vancouver Island region at the time of the survey and the number of households in the CVRD in 2015 were used to estimate of the amount of wood and pellets burned in the CVRD (assuming 2004 behaviours). The quantity of pellets and wood used in 2015 estimated from the 2004 WLAP are shown in Table 6 and Figure 1.

In addition to the three methodologies for calculating wood consumption from the three documents described above, RWDI attempted to contact four firewood sales providers in the CVRD. Three providers could not be reached (unavailable due to full voicemail boxes, closed websites, etc.). One provider responded but declined to provide data due to confidentiality issues but confirmed that sales have increased approximately 20% since 2010 and confirmed the CEEI estimate of energy consumed from burning firewood (494,412 GJ) for residential heating in 2010.

Table 6: Comparison of Estimated Wood Consumed for Space Heating in the CVRD (tonnes)

Study Used to Estimate Wood Consumption	Wood Consumed in CVRD (tonnes)	
	Wood	Pellet
2010 CEEI	32,304	
Mustel 2012 - "West Coast" (36% wood appliance use)	25,788	3,604
Mustel 2012 - "Comox Valley" (20% wood appliance use)	14,413	2,014
WLAP 2004 (Provincial wood stove emissions inventory)	25,680	521

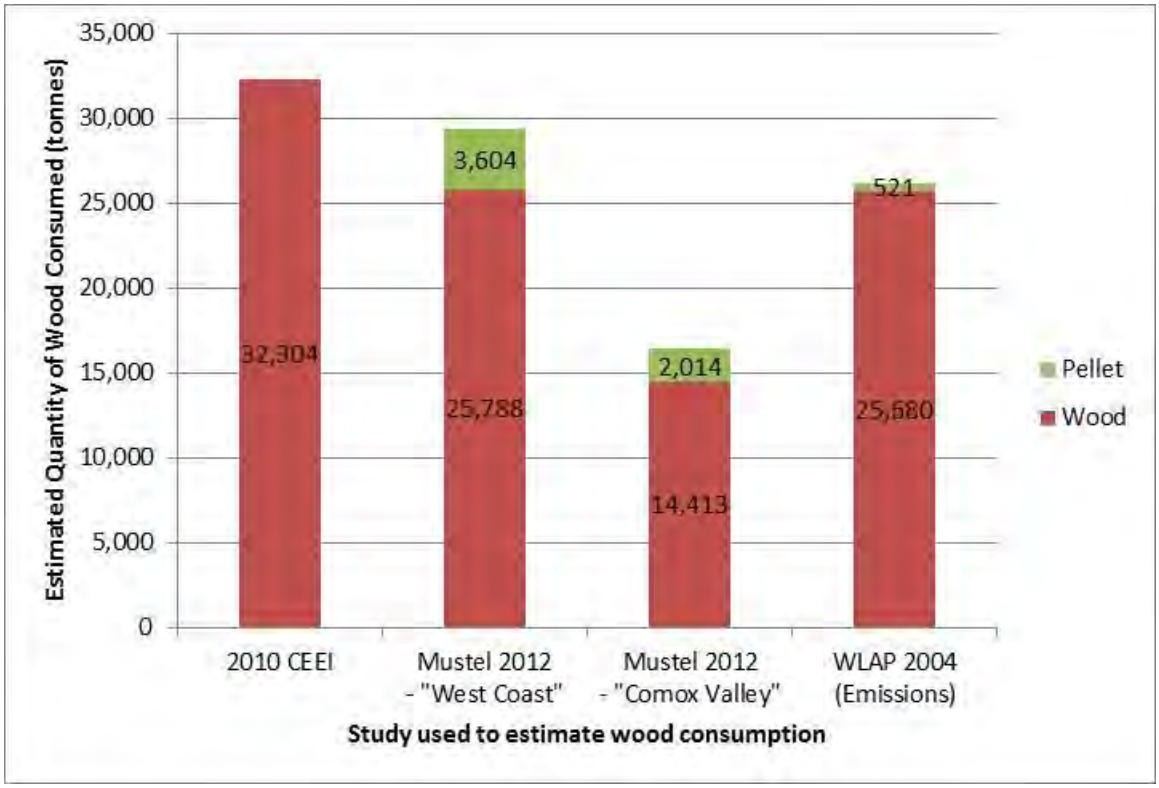


Figure 1: Estimated Quantity of Wood Consumed Using Different Studies

For this emissions inventory, it was assumed that 36% of households in the CVRD burned wood as per the Inventory of Wood-Burning Appliance use in the West Coast in 2012 (Mustel Group Market Research, March 2012). According to the Mustel Group report, 5% of wood-burning households burn pellets. Thus for simplicity, it was assumed that the remainder of households burning wood (95%) have cord wood burning appliances.

The methodology from the Residential Wood Burning Report (BC Ministry of Water, Land, and Air Protection (WLAP), May 2005) was used to estimate emissions from residential wood burning for space heating. The emission equation for PM from residential wood burning for space heating is shown in Equation 2.

Equation 2: Particulate Matter Emission Equation for Residential Wood Burning

$$PM = Wood\ Consumed\ (tonne) \times Percent\ of\ Applicance\ Type_{Other\ Vancouver\ Island}\ (\%) \times EF_{PM}(\frac{kgPM}{tonne\ wood})$$

Emissions from wood burning equipment are dependent on the type of appliance and technology used. As part of the detailed Residential Wood Burning Report (BC Ministry of Water, Land, and Air Protection (WLAP), May 2005), the amount of wood consumed by 11 types of technology was collected by survey across the Province.

The percentages of wood consumed by each appliance technology type for "Other Vancouver Island" (which excluded the Capital Regional District), excluding pellet stoves in 2004 is provided in Table 7. Results from the 2012 Mustel Survey (Mustel Group Market Research, March 2012) were used to allocate the total wood burned into each of the 11 technology types. The 2012 survey did not collect data for each of the 11 technology types, but rather provided the province-wide percentages of technology in larger groupings. The results of the 2004 and 2012 studies were used in combination to distribute the assumed cord wood consumption into 11 technology types, presented in Table 8.

The amount of wood burned per household was calculated from the average West Coast household use (2.2 cords/year/household), cord volume (2.27 m^3/cord) and wood species obtained from the Wood Stove Inventory and Behaviour Analysis Report (Envirochem Services Inc., December 2012). Densities for the BC wood species were obtained from the Residential Wood Burning Report (BC Ministry of Water, Land, and Air Protection (WLAP), May 2005) and used to calculate an average wood density. The amount of residential wood burned in the CVRD was determined by multiplying the amount of wood burned per household by the amount of wood burning households in the CVRD. Of those households assumed to burn wood, 95% were assumed to burn wood logs, and 5% were assumed to burn wood pellets. Finally, the amount of wood (25,788 tonnes wood logs) was multiplied by the percentage of each appliance type and appliance specific emission factors.

For pellet stoves, the same methodology was adopted. The amount of pellets burned per household was calculated from the average West Coast household use (78.3 bags/year/household) and bag weight (40 lbs/bag) obtained from the Wood Stove Inventory and Behaviour Analysis Report (Envirochem Services Inc., December 2012). To determine the amount of pellets burned in the CVRD, the average household amount was multiplied by the amount of wood burning households in the CVRD and assuming 5% of those households burned pellets. The amount of pellets (3604 tonnes) was then multiplied by the emission factors for pellet stoves.

Emission factors for each appliance type were obtained from the Residential Wood Burning (BC Ministry of Water, Land, and Air Protection (WLAP), May 2005) and shown in Table 9.

Table 7: Percentage of Wood Burning Appliance Types (%) from WLAP, 2004

Appliance Type	Fireplace; Advanced	Fireplace; Conventional Without glass doors	Central Furnace/Boiler (inside)	Central Furnace/Boiler	Central Furnace/Boiler (outside)	Fireplace Insert; Advanced Technology	Fireplace Insert; Catalytic	Fireplace Insert; Conventional	Woodstove; Advanced	Woodstove; Catalytic	Woodstove; Conventional	Pellet
% of Appliance Type	2%	14%	4%	0%	0%	2%	1%	9%	36%	5%	26%	-

Table 8: Percentage of Wood Burning Appliance Types (%) from Mustel, 2012 and WLAP, 2004

Appliance Type	Fireplace; Advanced	Fireplace; Conventional Without glass doors	Central Furnace/Boiler (inside)	Central Furnace/Boiler	Central Furnace/Boiler (outside)	Fireplace Insert; Advanced Technology	Fireplace Insert; Catalytic	Fireplace Insert; Conventional	Woodstove; Advanced	Woodstove; Catalytic	Woodstove; Conventional	Pellet
% of Appliance Type	7%	7%	2%	0%	1%	13%	1%	9%	51%	2%	7%	-

Table 9: Wood and Pellet Emission Factors (kg/tonne)

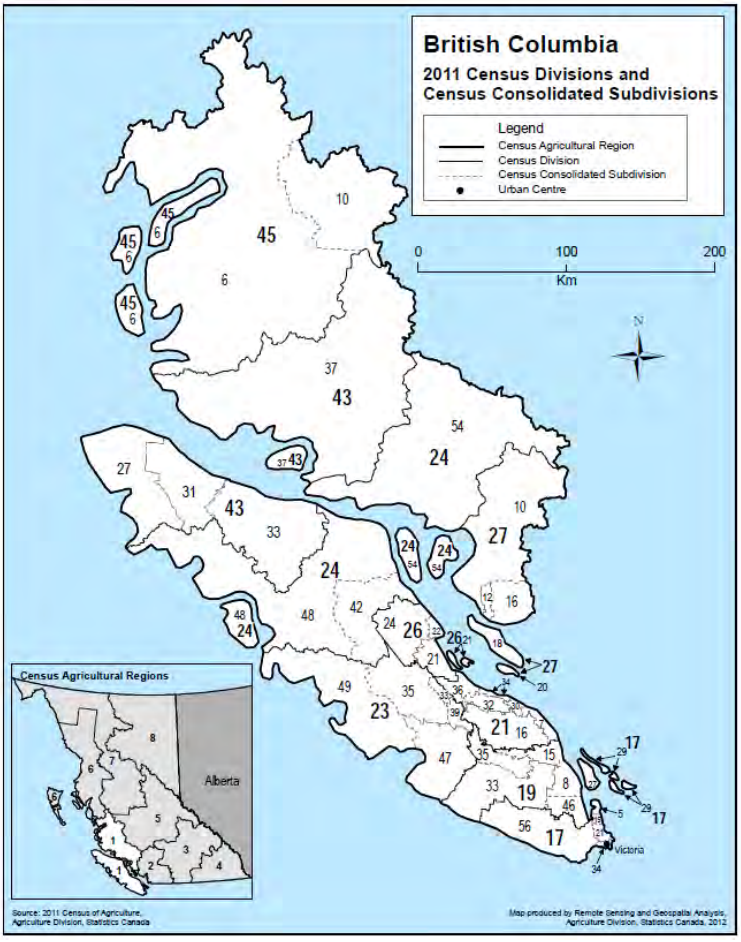
Appliance Type	Fireplace; Advanced	Fireplace; Conventional Without glass doors	Central Furnace/Boiler (inside)	Central Furnace/Boiler	Central Furnace/Boiler (outside)	Fireplace Insert; Advanced Technology	Fireplace Insert; Catalytic	Fireplace Insert; Conventional	Woodstove; Advanced	Woodstove; Catalytic	Woodstove; Conventional	Pellet
TPM Emission Factor	5.1	19.3	14.1	14.1	14.1	5.1	5.1	14.4	5.1	5.1	24.6	1.2
PM_{10} Emission Factor	4.8	18.5	13.3	13.3	13.3	4.8	4.8	13.6	4.8	4.8	23.2	1.1
$PM_{2.5}$ Emission Factor	4.8	18.4	13.3	13.3	13.3	4.8	4.8	13.6	4.8	4.8	23.2	1.1

2.2.2 Agricultural Sources

Particulate matter is produced from agricultural activities including the addition of synthetic fertilizers, tilling and harvesting of crops, wind erosion on fields, livestock husbandry, and the use of agricultural on- and non-road vehicles and equipment. Agricultural non-road vehicles and equipment is discussed further in section 2.3.2.

The Canadian Census of Agriculture provides the land in crops by crop type and the head of livestock (on a particular date) by Census Consolidated subdivision (CCS) every five years. The most current Census of Agriculture is from 2011, the 2016 Census data are not expected to be available until 2017 at the earliest. The base quantities used for the emissions from agricultural sources in this inventory were extracted from the 2011 Census of Agriculture for the CCSs for Comox Valley: Comox Valley A (5926021), Comox Valley B (Lazo North) (5926022), and Comox Valley C (Puntledge - Black Creek) (5926024). Census consolidated subdivisions (CCSs) within the CVRD are shown in Figure 2.

MAP 2A



26 Comox Valley
- 21 Comox Valley A
- 22 Comox Valley B (Lazo North)
- 24 Comox Valley C (Puntledge - Black Creek)

Figure 2: BC Census Division 1 (Vancouver Island-Coast) Showing Consolidated Subdivisions and the CVRD.

2.2.2.1 Synthetic Fertilizer Application

Particulate emissions were based on the method used by Environment Canada to calculate PM emissions from fertilizer application as part of the national emissions inventory. The emissions of PM are based on the quantity of fertilizer applied with global emission factors that account for the handling and storage as well as the spreading of fertilizers (Environment Canada, 2006). The general emission equation is shown in Equation 3. PM emission factors per tonne of fertilizer applied are shown in Table 10. The amount of fertilizer applied (summed per crop type) is equal to the area of land per crop multiplied by a fertilizer application density which varies by crop. The amount of fertilizer applied per crop uses the method developed by Sheppard *et al.* (Sheppard, Bittman, & Bruulsema, 2009) and is described further in Appendix 1. The area in each crop type by CCS is also shown in the Appendix.

Equation 3: Particulate Matter Emissions from Fertilizer Application

$$PM\ Emissions\ (kg) = Area\ of\ land\ per\ crop\ (hectare) \times Amount\ of\ Fertilizer\ applied\ per\ crop\ \left(\frac{kg}{ha}\right) \times PM\ Emission\ Factor\ \left(\frac{kg}{tonne}\right)$$

Table 10: Particulate Matter Emission Factors for Fertilizer Application

Pollutant	Emission Factor (kg/t Fertilizer)
TPM	2.23
PM_{10}	1.09
$PM_{2.5}$	0.31

2.2.2.2 Tilling

Particulate matter is released from the disturbance of soils during the tilling of fields and harvesting of crops. The EPA method for quantifying PM emissions from agricultural tilling activities was used with local improvements (Poon & Robbins, 2006). Tilling emissions are dependent on crop-specific and region-specific factors. Crop-specific factors including the area tilled and the number of tills per year (often expressed as the years between renovations). Region-specific factors include the moisture reduction factor (an expression of the local precipitation pattern) and the local silt content.

The general emission equation is shown in Equation 4. Emissions of TPM, PM_{10}, and $PM_{2.5}$ are calculated per crop type and per season. Emissions are based on the crop area (in hectares), the number of tillings (passes), and an emission factor calculated specifically for the region and season. The area per crop for each CCS is shown in Appendix 1.

Equation 4: Tilling Emission Equation

$$Emissions\ per\ crop\ per\ season\ _{(PM,PM_{10},PM_{2.5})} = Area\ per\ crop\ (ha) \times Number\ of\ tillings\ per\ crop\ and\ per\ season\ \times Emission\ Factor_{(PM,PM_{10},PM_{2.5})} \times Tillage\ Factor(unitless)$$

The number of tills per crop is based on the census agricultural region and the month. The number of tills (passes) for each region has been developed with expertise from Ministry of Agriculture staff as part of the BC Agricultural Air Emissions Inventory (RWDI, 2014). The detailed methodology for the number of tills per crop is shown in Appendix 1.

The tillage emission factor equation is shown in Equation 5. The base equation includes an empirically derived constant (5.38) multiplied by a moisture reduction factor, particle size multiplier, and the silt content. The particle size multiplier is used to estimate the fraction of TPM that is PM_{10} or $PM_{2.5}$. The particle size multiplier is typically assumed to be 0.21 for PM_{10} and 0.042 for $PM_{2.5}$.

Equation 5: Tilling Emission Factor Equation

$$Emission\ Factor_{(PM,PM_{10},PM_{2.5})} = 5.38\ \times Moisture\ reduction\ factor\ per\ season\ \times Particle\ size\ multiplier\ _{(PM,PM_{10},PM_{2.5})} \times Silt\ content\ per\ region\ (\%)^{0.6}$$

The moisture reduction factor reflects the precipitation accumulation which decreases the likelihood of particles becoming airborne. Moisture reduction factors were generated by month for each of the eight agricultural regions (based on the Census of Agriculture regions) for the detailed agricultural emissions inventory for the Ministry of Agriculture (MoA). The moisture reduction factors for Vancouver Island – Coast was used for the CVRD and are shown in Table 11.

Table 11: Moisture Reduction Factors for Tilling Emission Factor Equation

Month	Moisture Reduction Factor (unitless)
January	0.00
February	0.00
March	0.00
April	0.20
May	0.50
June	0.50
July	0.75
August	0.50
September	0.50
October	0.00
November	0.00
December	0.00

The silt content is a percentage based on typical soil type. The silt content values for each CCS were developed using data from the Soil Landscapes of Canada version 3.2, developed by Agriculture and Agri-Food Canada and shown in Table 12.

Table 12: Silt Content by CCS

CCS	Silt Content (%)
Comox Valley A	35.0
Comox Valley B Lazo North	43.6
Comox Valley C Puntledge - Black Creek	48.4

2.2.2.3 Harvesting

Particulate emissions from crop production arise from soil cultivation and harvesting. Emissions depend on crop, soil type, cultivation method, and weather conditions before and while working. Environment Canada's national air emissions inventory includes emission quantities and methods for agricultural tilling and wind erosion, but does not specifically include particulate emissions from harvesting.

The emission method from the BC Agricultural Air Emissions Inventory (RWDI, 2014) was used for this inventory. The general emission equation is shown in Equation 6. It is assumed that each crop is harvested only once annually. The PM_{10} emission factors are shown in Table 13. The California Air Resources Board $PM_{2.5}$ to PM_{10} ratio of 0.15 for agricultural harvesting (Countess Environmental, 2006) was used to estimate $PM_{2.5}$. Total PM was assumed to equal $PM_{10.}$ The area by crop type is provided in provided in the detailed method in Appendix 1.

Equation 6: PM_{10} Emissions from Agricultural Harvesting

$$Emissions_{PM_{10}}(kg) = Annual\ crop\ area\ (ha) \times Number\ of\ harvests\ \times Emisison\ factor\ \left(\frac{kg}{ha}\right)$$

Table 13: PM_{10} Emission Factors for Harvesting by Crop Classification Groupings

Crop Classification Category Groupings	PM_{10} Emission Factor (kg/ha)
Corn	0.12
Grass/hay/alfalfa	0.25
Cereal, grain and oilseed	0.47
Pasture	0.00
Peas/beans/early potatoes	0.31
All other vegetables	0.03
Turf	0.00
Tree fruits vines and berries	0.01

2.2.2.4 Wind Erosion

Particulate emissions also result from wind erosion of tilled agricultural lands. Particulate emissions from wind erosion of agricultural lands were calculated using the Wind Erosion Equation (WEQ) shown in Equation 7. The WEQ relies on crop-specific and region-specific factors. Crop specific factors include the surface roughness factor, the unsheltered field width factor and the vegetative factor. Crop-specific factors as developed for the BC Agricultural Air Emission inventory (RWDI, 2014) were used. Region-specific factors including the soil erodibility and climatic factor were developed for the Comox Valley.

Equation 7: Wind Erosion Equation

$$Emissions\ Factor_{PM\,10}\ \left(\frac{ton}{acre\ year}\right) = [Total\ suspended\ particulate\ portion\ (0.025)] \times I\ \left[Soil\ Erodibility\ \left(\frac{ton}{acre\ year}\right)\right] \times K\ [Surface\ roughness\ factor] \times C\ [Climatic\ factor] \times L'^{[Unsheltered\ field\ width\ factor]} \times V'[Vegetative\ cover\ factor]$$

Total PM was broken out into PM_{10} and $PM_{2.5}$ size fractions using factors from the WRAP Fugitive Dust Handbook (Countess Environmental, 2006). The PM_{10}/TPM ratio for wind erosion is 0.5; the $PM_{2.5}$/PM_{10} ratio is 0.15.

A detailed description of the development of the parameters K, C, L' and V' is provided in Appendix 1. Total PM, PM_{10}, and $PM_{2.5}$ emissions were calculated using the monthly emission factors generated from Equation 7 multiplied by the total area per crop. The area of each relevant crop was taken from the 2011 Census of Agriculture and is shown in Table 14.

Table 14: Crop Area by CCS for Wind Erosion Calculations

Wind Erosion Crop Grouping	Census Table	Census Fields	Crop Area (hectares)		
			Comox Valley A	Comox Valley B Lazo North	Comox Valley C Puntledge - Black Creek
Alfalfa	Hay and field crops 2011	Alfalfa_and_alfalfa_mixtures_hectares	284	83	197
Barley	Hay and field crops 2011	Barley_hectares	0	n/a	84
Grain Hays	Hay and field crops 2011	Mixed_grains_hectares	n/a	183	1977
		Canola_rapeseed_hectares			
		Flaxseed_hectares			
		All_other_tame_hay_and_fodder_crops_hectares			
Potatoes	Hay and field crops 2011	Potatoes_hectares	1	n/a	n/a
Vegetables	Vegetables excluding greenhouse	Total vegetables excluding greenhouse vegetables_hectares	19	28	n/a

2.2.2.5 Livestock movements

Particulate emissions from animal production result from animal housing and moving facilities. The emissions methodology for PM from cattle, swine, poultry and horses was selected from the " Review of gricultural ir Emissions Estimates for the Lower Fraser Valley of British Columbia" (Poon & Robbins, 2006). The transfer of methodology from the LFV to CVRD assumes that agricultural livestock production operates similarly in both regions. The number (head) of livestock was taken from the 2011 Census of Agriculture and is shown in Table 15.

Table 15: Number of Livestock by CCS

Livestock	Number of Livestock (head)		
	Comox Valley A	Comox Valley B Lazo North	Comox Valley C Puntledge – Black Creek
Horses	74	19	255
Swine	97	71	603
Poultry	3,857	1,232	18,586
Cattle	48	63	112

The recommended method for deriving emissions from cattle assumes that only cattle in beef feedlots generate significant PM and that the best conservative estimate of the number of cattle in beef feedlots is based on the number of beef steers. The number of steers was taken from the 2011 Census of Agriculture and is shown in Table 15.

The published PM_{10} emission factor is 11 kg/1000 head/day, with particle size multipliers of 3.0 for TPM and 0.15 for $PM_{2.5}$ resulting in the emission factors shown in Table 16. A climate correction factor of 0.572 was generated for the Comox Valley which is equal to fraction of days with less than 2.0 mm of rain in the region.

Equation 8: Particulate Matter Emissions from Cattle

$$PM_A = \frac{Number\ of\ Steers}{1000\ head} \times EF_{PM10,daily} \times Particle\ size\ multiplier_A \times climate\ correction\ factor \times days\ in\ feedlots \quad (365)$$

Table 16: Particulate Matter Emission Factors for Cattle

Pollutant	Effective Emission Factor (kg/1000 steer/day)
TPM	33
PM_{10}	11
$PM_{2.5}$	1.65

The recommended methodology for calculating emissions for swine uses Equation 9 with a TPM emission factor of 1.854 mg/hr/kg swine. PM_{10} to TPM and $PM_{2.5}$ to TPM ratios of 0.5 and 0.1 were used. The mass per animal is shown in Table 17.

Equation 9: Particulate Matter Emissions from Swine

$$PM = Number\ of\ swine\ (head) \times Mass\ per\ animal\ (\frac{kg}{head}) \times EF_{PM,hourly} \times Hours\ per\ year\ (8760) \times Particle\ size\ conversion$$

Table 17: Assumed Mass of Animal (Swine)

Census Livestock Category		Number of head	Mass per head kg/head
Swine	Boars_number	9	230
	Sows_and_gilts_for_breeding_number	80	170
	Nursing_and_weaner_pigs_number	270	47
	Grower_and_finishing_pigs_number	412	47

The recommended method for estimating emissions from poultry depends on the length of production cycle and varies for pullets and laying hens versus broilers, turkeys, and other poultry. The emission estimation method was varied between layers (pullets under 19 weeks intended for laying, laying hens19 weeks and over, and layer and broiler breeders) and non-layers (broilers roasters and Cornish, turkeys, and other poultry). The emissions from layers were calculated by bird type using Equation 10. The number of livestock, TPM emission factors, PM_{10} to PM and $PM_{2.5}$ to PM ratios, and hours per production cycle for layers is shown in Table 18.

The emissions from broilers (non-layers) were calculated by bird type using Equation 11. The number of livestock, PM emission factors, PM_{10} to TPM and $PM_{2.5}$ to TPM ratios, and hours per production cycle for broilers (non-layers) is shown in Table 19.

Equation 10: Particulate Matter Emissions from Poultry Layers

$$PM = Number\ of\ birds\ (head) \times Mass\ per\ animal\ (\frac{kg}{head}) \times EF_{PM,production\ cycle}\ (\frac{\frac{mg}{hr}}{kg\ bird}) \times Hours\ of\ production\ per\ year\ (8760) \times Particle\ size\ conversion$$

Equation 11: Particulate Matter Emissions from Poultry Broilers (non-layers)

$$PM = Number\ of\ birds\ (head) \times Mass\ per\ animal\ (\frac{kg}{head}) \times EF_{PM,production\ cycle}\ (\frac{\frac{mg}{hr}}{kg\ bird}) \times Hours\ of\ production\ per\ day\ \times (Days\ of\ production + days\ of\ cleanout) \times cycles\ per\ year \times Particle\ size\ conversion$$

Table 18: Emission Equation Factors for Poultry Layers

Census Livestock Category		Number of head	Mass per head kg/head	EF for production cycle mg/hr/kg	Hours per production hr/yr
Poultry	Pullets under 19 weeks, intended for laying (63)	1605	0.75	1.266	8760
	Laying hens, 19 weeks and over (64)	5215	1.8	1.266	8760
	Layer and broiler breeders (pullets and hens) (65)	333	1.8	1.266	8760

Table 19: Emission Equation Factors for Poultry Broilers (non-layers)

Census Livestock Category		Number of head	Mass per head kg/head	EF for production cycle mg/hr/kg	hours/day hr/day	days production days	cleanout days per cycle days	cycles per year cycles/year
Poultry	Broilers, roasters and Cornish (66)	11870	1	5.61	24	40	2	6.5
	Turkeys (67)	2067	4.9	5.61	24	75	2	3.5
	Other poultry	2585	1.8	5.61	24	75	2	3.5

The recommended method for quantifying emissions from horses separates the animals into those in riding rings versus those in paddocks. This method uses the total number of horses from the Census of Agriculture and assumes a split between horses in riding rings (75%) and horses in paddocks (25%). The assumed splits are based on data from the Lower Fraser Valley with an assumption that the split is similar in the CVRD. The general emission equation is shown in Equation 12 and the emission factors are shown in Table 20.

Equation 12: Particulate Matter Emissions from Horses

$$Emissions\ (kg) = Number\ of\ horses(head) \times EF(\frac{kg}{head})$$

Table 20: Particulate Matter Emission Factors for Horses

Pollutant	Horse Emission Factor (kg/head)	
	Paddocks	Riding Rings
TPM	2.15	1.61
PM_{10}	0.72	0.54
$PM_{2.5}$	0.11	0.08

2.2.2.6 Crop Residue Burning

Open burning is one disposal option for excess vegetation (crop residue) from crop production. Emissions are based on an assumption of the amount of crop residue produced, the proportion of this residue which is disposed of by incineration, and an emission factor. Emissions from the burning of crop residue were calculated using Equation 13. The amount of crop residue produced is calculated using the land area in crops (by crop category) and an assumed rate of residue production (Fuel Loading) per crop type.

Equation 13: Agricultural Waste Burning Equation

$$Emissions\ (kg) = Crop\ area\ (hectares) \times Fuel\ Loading\ \left(\frac{tonne\ residue}{hectare}\right) \times Percentage\ of\ dry\ crop\ residue\ burned\ (\%) \times Emission\ Factor\ \left(\frac{kg}{tonne\ residue}\right)$$

Crop residue production (fuel loadings) were assigned by crop category. The percentage of dry crop residue burned in various regions across the province was developed as part of the BC Agricultural Air Emissions Inventory to be 0.5%. PM emission factors per crop were selected from the California Air Resources Board and grouped into crop categories relevant to BC (California Air Resources Board, 2014). Emission factors and fuel loadings per crop type are shown in Table 21.

Table 21: Crop Residue Burning Emission Factors and Waste Production Rates

Land Cover Category	Emission Factors (kg/tonne)			Fuel Loading (tonnes/hectare)
	TPM	PM_{10}	$PM_{2.5}$	
Corn	5.8	5.7	5.4	9.4
Field Crops - Vegetables	8.7	8.5	8.2	4.7
Orchard Crops	4.0	4.0	3.7	5.1
Vine Crops	3.2	3.2	3.0	4.7
Field Crops - Hay	8.7	8.5	8.2	4.7
Grapes	3.2	3.2	3.0	14.0

The crop area by crop type was taken from 2011 Census of Agriculture for the census consolidated subdivisions (CCSs) within the CVRD. The total area in hectares for each crop category and for each CCS in the CVRD are shown in Appendix 1.

2.2.3 Open Burning

Open burning is a significant source of PM emissions in BC (Environment and Climate Change Canada, 2016). This source can be divided into three sub categories: prescribed & pile burning (land clearing and forestry operations); backyard burning; and, forest fires.

2.2.3.1 Prescribed & Pile Burning

Open burning is a common practice in British Columbia due to the needs of forest management and also disposal of debris related to logging activities and land clearing. Particulate matter emissions from open burning depend on the amount and type of waste burned. Open burns are categorized by their size and nature per the BC Wildfire Regulation, as described in Table 22.

The Ministry of Forest, Lands and Natural Resource Operations (FLNRO) maintains an Open Fire Tracking System (OFTS) through their Wildfire Branch. This inventory keeps track of Category 3 (Pile) and Category 4 (resource management) burns in British Columbia through the issuance of Burn Registration Numbers (BRNs). The BRN data recorded through the Wildfire Branch in the OFTS are the most complete record of open burning activities available in the Province, and thus, were adopted as the activity data for this particular emissions inventory.

Table 22: BC Wildfire Regulation Open Fire Categorization

Open Fire Category	Description
Category 1 (Camp Fires and Backyard Burns)	An open fire that meets both of the following requirements: a) the open fire burns material in one pile no larger than 0.5 m in height and 0.5 m in width; and b) the open fire is lit, fuelled or used: i. by any person for a recreational purpose, or ii. by a first nation for a ceremonial purpose.
Category 2	An open fire, other than a camp fire, that: a) burns material in one pile not exceeding 2 m in height and 3 m in width, b) burns material concurrently in 2 piles each not exceeding 2 m in height and 3 m in width; or c) burns stubble or grass over an area that does not exceed 0.2 ha.
Category 3	An open fire that burns a) material concurrently in 3 or more piles each not exceeding 2 m height and 3 m in width, b) material in one or more piles each exceeding 2 m in height or 3 m in width, c) one or more windrows, or d) stubble or grass over an area exceeding 0.2 ha.
Category 4 (Resource Management Open Fire)	An open fire that: a) burns unpiled slash over an area of any size, or b) is not a campfire or a category 2 or 3 open fire and is lit, fuelled or used for silviculture treatment, forest health management, wildlife habitat enhancement, fire hazard abatement, ecological restoration or range improvement.

Source: Government of British Columbia, 2005.

The OFTS BRN data were obtained from the Ministry for the 2015 calendar year. The records include both pile (in number of piles/windrows) and area (in hectares) burn registrations. The amount of material burned can be estimated using either the number of piles or the area of the burn. The emissions equations for regulated burns by number of pile or by area burned areas are shown in Equation 14 and Equation 15.

Equation 14: Regulated Pile Burn Emissions

$$\textit{Pile Burn Emission (kg)} = \textit{Emission Factor (kg/tonne)} * \textit{Net Mass Per Pile (tonnes)} * \textit{Number of Piles} / 1{,}000$$

Equation 15: Regulated Area Burn Emissions

$$\textit{Area Burn Emission (kg)} = \textit{Emission Factor (kg/tonne)} * \textit{Fuel Loading (tonnes / hectare)} * \textit{Burn Area (hectares)} / 1{,}000$$

The province-wide OFTS BRN data was filtered for regulated burns in the CVRD (using associated latitude / longitude coordinates in ArcGIS) and to remove duplicate entries, resulting in 40 regulated burns in the CVRD in 2015.

For pile burning, a method to categorize the pile burns into different pile classes was adopted from a 2010 BC MOE emissions inventory (McCormick, 2013). The first step of this method was to produce a frequency distribution for the categorization of different pile classes.

Break points were identified at 5 piles and fewer, 5 to 10 piles and more than 10 piles. Pile classes were assigned C (Very Dirty), B (Dirty) and A (Clean), respectively. Pile class statistics within the area of interest are presented in Table 23 and Figure 3. An additional 13 BRN records were classified as area burns.

In addition to the OFTS BRN data, the Denman Island and Cumberland Fire Service areas reported 10 permits for land-clearing each. These additional 10 permits were assumed to be class C piles with an average of 2.25 piles per permit (equal to the number of piles per permit from the BRN data).

Table 23: Pile Burn Statistics from 2014 OFTS BRN Data

Pile Class	Number of BRN Records	Total Number of Piles	Percent of BRNs	Percent of Total Pile Burns	Description
Class A	16	1,620	59%	97%	> 20 piles / BRN
Class B	3	40	11%	2%	5-19 piles / BRN
Class C	8	18	30%	1%	1-5 piles / BRN
Class C from Fire Service District Permits	20*	45	n/a	n/a	Assumed 2.25 piles / Permit

*Both the Denman and Cumberland Fire Services reported 10 permit each for landclearing

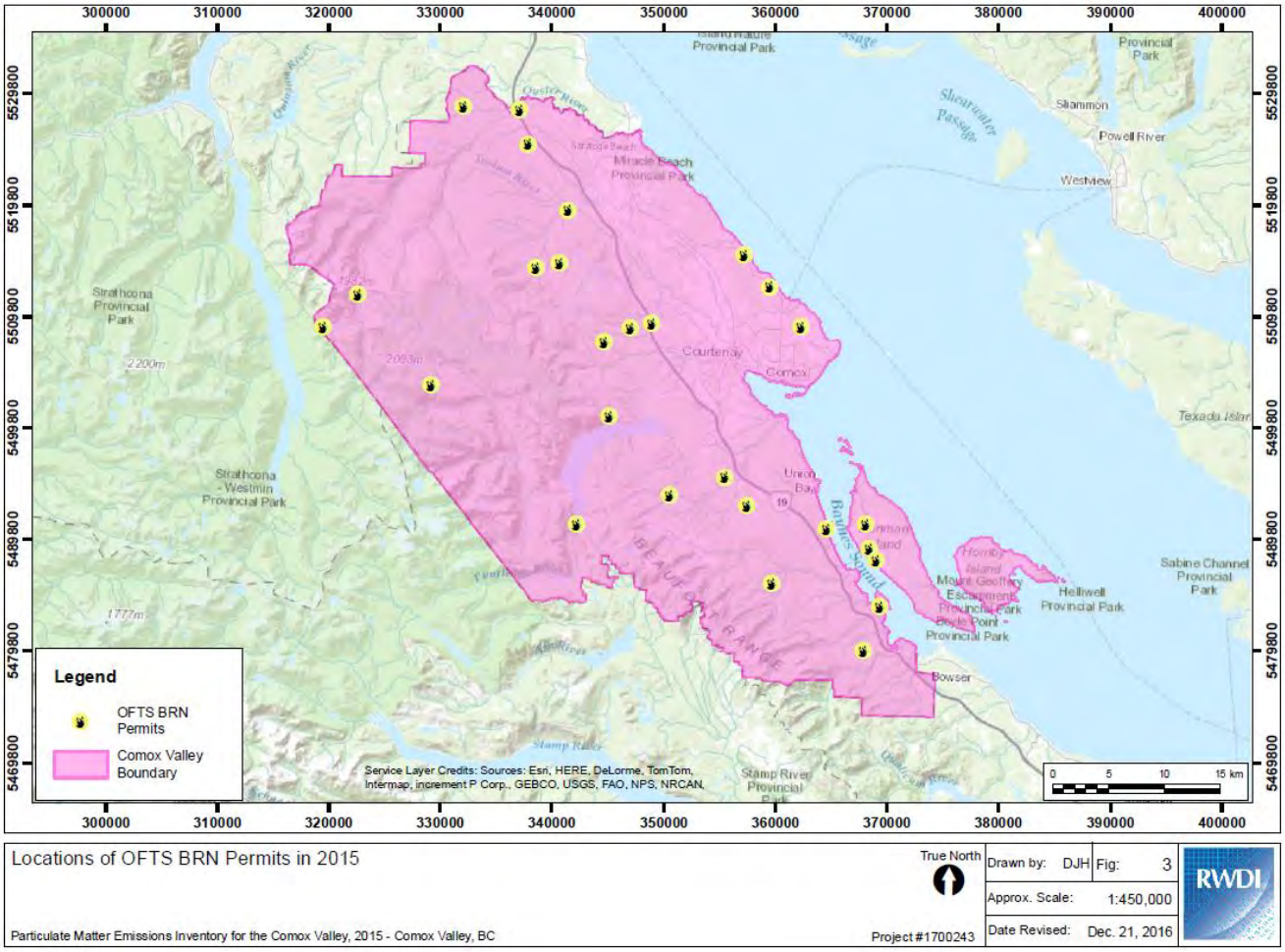


Figure 3: Locations of OFTS BRN Permits in 2015

2.2.3.2 Pile and Area Burn Assumptions

Assumptions were made for pile and area open burns to estimate the amount of material burned as a necessary input for emission calculations. Assumptions for the different pile classes were adapted from the 2010 BC MOE emissions inventory report (McCormick, 2013) and are presented in Table 24. Piles were assumed to be parabolic in shape, with a packing ratio that varied based on the class of pile due to the assumption that operators doing larger numbers of pile burns are typically better at making tight, organized piles. The wood density value is an average calculated from several tree species commonly found in BC forests.

Table 24: Pile Burn Size and Net Mass Assumptions

Pile Class	Pile Height (m)	Pile Width (m)	Pile Volume (m^3)	Packing Ratio	Consumption Factor	Wood Density (lb per ft^3)	Wood Density (kg per m^3)	Net Mass per Pile (tonnes)
Class A	6.0	9.0	190.85	0.25	0.9	27.7	444.63	19.09
Class B	6.0	9.0	190.85	0.15	0.9	27.7	444.63	11.46
Class C	6.0	9.0	190.85	0.10	0.9	27.7	444.63	7.64

The only assumption required for area burns was an estimate of the fuel loading value, which is the estimated number of tonnes of material per hectare. A value of 7.2 tonnes per hectare value was adapted from the US EP ’s P-42 Chapter 2, Section 5 on Open Burning (US EPA, 1992). Most ‘area burns’ in the area of interest were assumed to be resource management burns due to their Category 3 or 4 classifications. As such, the material burned is assumed to be wild grasses and shrub / brush mix. To represent this type of burn material, the fuel loading value for the refuse category “Weeds – Unspecified” was adopted for area burns.

2.2.3.3 Emission Factors

The final emission factor used in the calculation of PM emissions from both pile and area open burn is 0.63 kg per tonnes of mass consumed and is shown in Table 25. This emission factor for burns was referenced from the Metro Vancouver 2005 Lower Fraser Valley Air Emissions Report, Table B.1.2.1 for Burning for the Prescribed Burning category (MV 2010).

Table 25: Open Burning Emission Factors (kg per tonne of mass consumed)

Burn Type / Class	TPM	PM_{10}	$PM_{2.5}$
Class A	11.0	7.8	6.8
Class B	13.5	10.0	8.5
Class C	18.0	14.0	11.9
Area	8.0	5.9	5.1

2.2.3.4 Backyard burning

Backyard burning refers to the burning of clean, untreated wood or other organic materials on residential properties. For this inventory, backyard burning includes Category 1 (camp fires and backyard burns) and Category 2 open fires under the backyard burning category. Category 1 and Category 2 open fires can be regulated and/or tracked by regional and municipal authorities. Fire Chiefs from the local fire districts were contacted to obtain information regarding burning behavior in their respective areas. Each Fire District was asked to provide the number of fire permits issued in 2015 and the number of fires suspected to be lit without a permit. The survey also asked whether backyard burning is banned for part or all of the year. A copy of the survey is provided in Appendix 2.

In the rural areas of the CVRD, it is common practice to burn residential yard waste such as brush, grass clippings or leaf litter. Backyard burning is banned in the City of Courtenay, the Town of Comox and the Village of Cumberland. The Village of Cumberland passed a bylaw on February 27, 2017 to prohibit yard waste fires, previously there had been a spring yard waste burning period. Occasionally household garbage may be burned;

however, it has not been included in this emissions inventory as it is on the prohibited items list of the Open Burning Smoke Control Regulation, and is considered a rare practice.

The CVRD also provided data from Comox Valley Waste Management Centre regarding the amount and types of material collected as well as collection data for the City of Courtenay. The average burnable waste generated per capita was calculated for the City of Courtenay, Comox, and Cumberland for 2015 using the sum of wood, grass, organics and yard waste collected and is shown in Table 26.

Table 26: Yard, Wood, Grass & Leaves and Organic Waste Generated in the Comox Valley by Community

Community	Population	Waste Collected (tonnes)	Waste Generation Rate (kg per capita)
Comox	13,627	1697	124.6
Courtenay	25,744	2365	91.9
Cumberland	3,398	343	100.9

The average of yard waste generation rates for the City of Courtenay (91.9 tonnes/person) was used to estimate the total waste generated in rural areas. This waste generation rate was multiplied times the population in rural areas including Cumberland, and the electoral areas (25,812 people) (Comox Valley Regional District, 2013). The actual amount of waste collected in the rural areas, provided by the CVRD was subtracted and the remainder was assumed to be burned. The values are presented in Table 27.

Table 27: Yard Waste Generated, Collected and Burned (tonnes per year)

2011 CVRD Population	25,812	people
Yard Waste Generation	91.9	kg/capita/year
Estimated Waste Generation	2,371	tonnes/year
Actual Waste Collected	522	tonnes/year
Estimated Yard Waste Burned	1,849	tonnes/year

Using the data from the Comox Valley Waste Management Centre, percentages of the materials collected were calculated and multiplied by the amount of material burned and the PM emission factors from AP-42 Chapter 2, Section 5 on Open Burning (US EPA, 1992). The quantities burned and PM emission factors from backyard burning are listed in Table 28. As the majority of particulate matter is submicron in size (US EPA, 1992), the TPM is equal to the PM_{10} and $PM_{2.5}$ amounts.

Table 28: Particulate Matter Emission Factor and Material Quantities from Backyard Burning

Material	US EPA Category	TPM EF (kg/tonne)	Percentage of Material Collected (%)	Quantity of Material Burned (tonnes)
Yard Waste	Unspecified Weeds	8	81%	1492
Clean Wood Waste	Unspecified forest residue	8	7%	136
Cut Grass & Raked Leaves	Unspecified Leaves	19	12%	221

To verify the amount of waste burned, RWDI contacted nine fire districts and obtained information regarding the number of permits issued in 2015. Each permit was assumed to represent 1.5 piles since most people burn one to two piles per permit. Additionally, the number of fires without a permit (as estimated by each Fire District) was included and assumed to represent a single fire. The amount of material burned was calculated using the same assumptions as opening burning for Class C (1-5 piles) in Table 24 but the pile size was changed to a maximum of 2 m x 3 m as per the BC Wildfire regulation for Category 2 burns (Government of British Columbia, 2005). The estimated amount of material burned is presented in Table 29. This amount (1000 tonnes) is similar in magnitude to the yard waste estimated using the data from CVRD (1849 tonnes), and thus, the emissions from backyard burning are assumed to be reasonable.

Table 29: Estimated Amount of Backyard Burn Material (tonnes per year)

Fire Type	Number of Permits*	Number of Fires	Amount of Material Burned in 2015 (tonnes)
Backyard Burn Permit	1436	2154	460
Burns without a Permit	*	865	195
Recreational Fires	385	385	0.8
Landclearing Fires**	20	45	344
		Total Amount Burned	***999.8***

*The number of fires without a permit was provided by survey with each fire district, thus there is no value for the number of permits
**Emissions from landclearing fires are addressed in section 2.2.3.1 and these amounts have been added into Table 23

2.2.3.5 Wildfire

The BC Wildfire Service collects and publishes several types of data on current and historical wildfires throughout the province. They also published a dynamic list and interactive map of all current wildfires larger than 0.01 hectares for the current year (May 2016-May 2017) for each Fire Service Area. A filter of the Coastal Fire Centre current wildfire list for fire areas 7 and 8 resulted in a list of 6 fires totaling 43.8 hectares, all of which were outside of the Comox Valley.

The BC Wildfire service also produces GIS files with the point locations and sizes (polygons) for wildfires in 2016. The point locations file listed 1,049 individual fires in the province, but the size file only lists sizes for 214 fires. When compared to the Comox Valley, the point locations file listed 10 wildfires, but none of these fires were listed in the size file, meaning the corresponding size of each fire is unknown.

In addition, the BC Wildfire Service publishes historical wildfire data including locations, size, and data in GIS format to the end of 2014. This data source listed two wildfires with a total of 5.3 hectares burned in 2014. This dataset, being the most complete set of recent data, was used for determining emissions from wildfires.

Wildfire emission factors were calculated from data obtained from Wildfire CAC Emission Inventory for 2011 report (McCormick, 2012). The estimated amount (in tonnes) of TPM, PM_{10} and $PM_{2.5}$ emitted were divided by the total area burned for the Coastal Region. The effective emission factors for the Coastal Region and the corresponding emissions estimated for wildfire burns in the CVRD are presented in Table 30.

Table 30: Effective Emission Factors for Wildfire Burning in the Coastal Region (kilogram per hectare)

Emission Factor (kg/ha)		
TPM	**PM_{10}**	**$PM_{2.5}$**
667	481	444

2.2.4 Miscellaneous Sources

Miscellaneous sources of PM include meat cooking, cigarettes, dry cleaning, crematoria, and structural fires. PM emissions from the BC emissions inventory (Environment and Climate Change Canada, 2016) were scaled to the CVRD using human population. PM emissions from the BC emissions inventory are shown in Table 31. Population was taken from BC Statistics (BC Statistics, 2016), the 2014 population for BC used was 4,638,415, and the population for the CVRD for 2015 was 64,634.

Table 31: 2014 BC Emissions from Miscellaneous Sources

Emission Source			2014 BC Emissions (tonnes per year)		
			TPM	**PM_{10}**	**$PM_{2.5}$**
Area	Miscellaneous	Meat Cooking	1,114.0	1,114.0	1,114.0
		Cigarettes	39.0	39.0	39.0
		Dry Cleaning	1.0	1.0	1.0
		Crematorium	1.0	1.0	1.0
		Structural Fires	22.0	22.0	20.0
		Miscellaneous subtotal	***1,177.0***	***1,177.0***	***1,175.0***

2.3 Mobile

Mobile emission sources include on-road vehicles, non-road equipment, marine vessels, locomotives and aircraft. Direct PM emissions from mobile transportation sources are a small portion of the TPM in BC at less than 1% (Environment and Climate Change Canada, 2016).

PM emissions from the BC emissions inventory (Environment and Climate Change Canada, 2016) were scaled to the CVRD using appropriate surrogate data for all mobile sources except marine transportation. Mobile emissions for all of BC are shown in Table 32.

The emission amounts in Table 32 were scaled down to the CVRD region using surrogate data from the 2010 CEEI, the 2011 Census of Agriculture and Statistics Canada. The specific surrogates used for each emission source by the categories used in the 2014 BC air emissions inventory are shown in Table 33. The surrogates used for each mobile emission source are also further discussed in the following sections.

Table 32: Province-Wide (BC) Mobile Source Emissions for 2014

Emission Source				2014 BC Emissions (tonnes per year)		
				TPM	PM_{10}	$PM_{2.5}$
Mobile	On-road	Light-duty	Light-duty diesel trucks	36	36	35
			Light-duty diesel vehicles	33	33	32
			Light-duty gasoline trucks	297	297	273
			Light-duty gasoline vehicles	255	255	235
			Motorcycles	3	3	3
		Heavy-duty vehicles	Heavy-duty diesel vehicles	1181	1181	1146
			Heavy-duty gasoline trucks	61	61	56
	Non-road vehicles		Off-road use of diesel	1225	1225	1200
			Off-road use of gasoline/LPG/CNG	579	557	524
	Marine Vessels		Marine Transportation	2599	2495	2296
	Aircraft		Air Transportation	218	218	196

Table 33: Mobile Emission Scaling Surrogates

Emission Source			BC 2014 Category	BC Value	Comox Valley Value	Scaling Surrogate Name		Surrogate Data Source
Mobile	On-road	Light-duty	Light-duty diesel trucks	73,198,229	1,369,459	Diesel (litres)	Light Trucks, Vans, SUVs	CEEI, 2010
			Light-duty diesel vehicles	35,730,800	1,096,181	Diesel (litres)	Small Passenger Cars	
			Light-duty gasoline trucks	2,404,995,683	40,157,147	Gasoline & hybrid (litres)	Light Trucks, Vans, SUVs	
			Light-duty gasoline vehicles	1,803,891,002	34,484,704	Gasoline & hybrid (litres)	Small Passenger Cars	
			Motorcycles	14,451,157	305,713	Gasoline (litres)	Motorcycles, Mopeds	
		Heavy-duty vehicles	Heavy-duty gasoline trucks	1,212,620,517	9,794,534	Diesel (litres)	Bus	
							Commercial Vehicles	
							Motorhomes	
							Tractor Trailer Trucks	
			Light-duty diesel trucks	341,375,603	4,715,081	Diesel, hybrid, other (litres)	Bus	
							Commercial Vehicles	
							Motorhomes	
							Tractor Trailer Trucks	
	Non-road vehicles		Off-road use of diesel	62,900	1,188	Number Owned & Leased	Total Farm Machinery	Census of Agriculture, 2011
			Off-road use of gasoline/LPG/CNG					
	Non-road vehicles		Off-road use of diesel	13,125,233	147,338	Dollar Value $	Total Building Permits, 2015	BC Statistics
			Off-road use of gasoline/LPG/CNG					
	Aircraft		Air Transportation	1,398,732	21,124	Number	Total, itinerant and local movements (3)	Statistics Canada

2.3.1 On-road vehicles

The 2014 BC emissions inventory estimates for on-road vehicles were scaled from a BC total to the CVRD using the predicted fuel consumption from the 2010 CEEI reports for BC. Fuel consumption by thirteen vehicle class and fuel type combinations from the CEEI were mapped to seven mobile source categories from the BC inventory. Each of the seven mobile source categories was scaled from the Provincial to regional total individually.

2.3.2 Non-road equipment

Non-road equipment can be further divided by sector of use including: agricultural; construction; industrial; commercial; lawn and garden equipment; and, recreational off-road vehicles. However, results from the FVRD have indicated that agricultural and construction equipment contributes to over 85% of the PM from all non-road sources (RWDI, 2016). The 2014 BC emissions inventory estimates for non-road vehicles were therefore scaled to the CVRD using appropriate scaling factors derived from surrogate data for agricultural and construction equipment. BC emissions from non-road equipment were assumed to be split between agriculture and construction at 50% share per sector. Each of these emissions were then downscaled to the CVRD using the surrogates listed in Table 33. The number of vehicles owned and leased as reported to the 2011 Census of Agriculture by census consolidated subdivision (CCS) was used to scale the non-road agricultural equipment emissions. The 2015 annual dollar value in building permits was used to scale the non-road construction equipment emissions.

2.3.3 Marine Vessels

Particulate emissions are expected to be produced by ferries, recreational vessels and fishing vessels in the Comox Valley. For this study, emission estimates from marine vessel movements in 2015 were provided by Environment and Climate Change Canada (ECCC) from earlier results output from the prototype Marine Emission Inventory Tool (MEIT v4.1). It should be noted that the values provided from MEIT have not been fully validated (per ECCC). Emissions from MEIT were provided for the region shown in Figure 4. Emissions over this area are shown in Table 34.

Table 34: Marine Emission Inventory Tool Emissions[1] for the CVRD[2]

Emission Source	2015 MEIT Prototype Emissions (tonnes per year)		
	TPM	PM_{10}	$PM_{2.5}$
Marine Vessels	19.4	19.4	17.8

1. Emissions were extracted from a MEIT prototype and have not been validated yet
2. Emissions from MEIT were provided for a region bounded by a latitude range of -125.555 and a longitude range of -124.570 and 49.921 and 49.404.

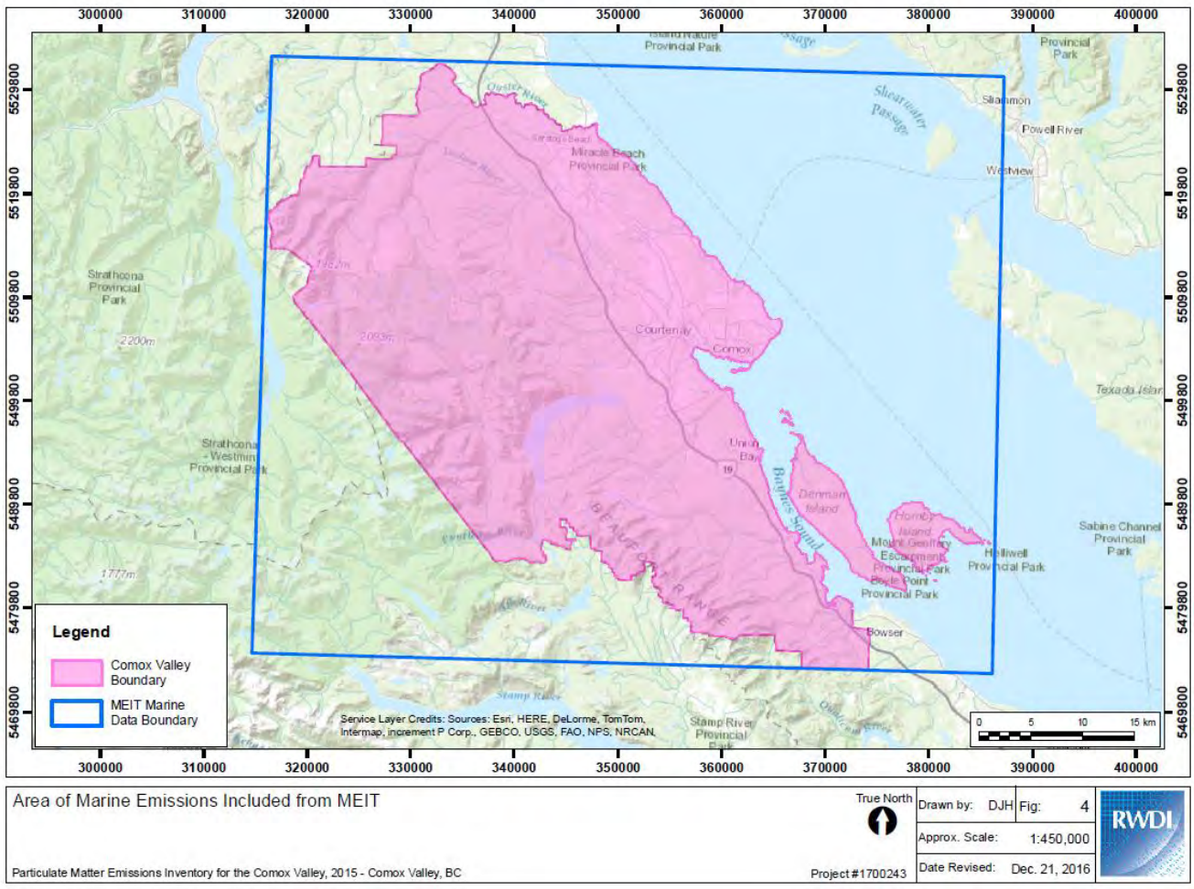


Figure 4: Map of Marine Emissions Included from MEIT

2.3.4 Locomotives and Rail Equipment

All railways within the geographic scope of this project were closed prior to 2011 resulting in zero PM emissions from this source.

2.3.5 Aircraft

RWDI obtained the number of Landings and Take-offs (LTOs) for civilian and military aircraft at the Comox Valley Airport in 2015 from the Royal Canadian Air Force's 19 Wing Comox AFB. A representative from the Comox Valley Airport confirmed that although aircraft movements vary from year to year, traffic did not increase significantly in 2015. Two smaller commuter and recreational airports were contacted by email for information but neither responded. Canada wide aircraft movements were also collected from Statistics Canada for 2014 and are listed in with the Comox totals in Table 35.

Table 35: Total Aircraft Landings and Take-offs (LTOs)

Region	2015 LTOs
Canada	6,085,333
British Columbia	1,398,732
Comox	21,124

The BC emission estimates from aircraft were downscaled to the CVRD using the total aircraft movements from the Comox Valley Airport and the total for all airports in BC as reported by Statistics Canada (Statistics Canada, 2016).

2.4 Fugitive Dust

Fugitive dust emissions result from mobile equipment operating on dust emitting surfaces such as from paved and unpaved roadways, industrial areas, and landfills. Fugitive dust sources included in this section are associate with industrial sources, construction operations, and landfills. Fugitive dust from paved and unpaved roads has been included in a separate section. Emission estimates for fugitive dust from roads are typically large, however, as noted previously, most fugitive road dust is in the coarse (>44 µm) size fraction (Pace, 2005) and thus settles out of the air in close proximity (e.g., within 100 meters) of the emission source (Desert Research Institute, 2000).

2.4.1 Industrial sources

Tayco Paving Company was the only industrial facility within the CVRD to report emissions of fugitive dust to the NPRI in 2014 as shown in Table 36.

Table 36: Fugitive Dust PM Emissions from Industrial Sources reported to the NPRI in 2014

Emission Source			2014 Emissions (tonnes per year)		
			TPM	PM_{10}	$PM_{2.5}$
Fugitive Dust	Industrial Sources	Tayco Paving Company	3.74	1.06	0.11

2.4.2 Construction Operations

Fugitive dust from construction operations were calculated using the method described in Metro Vancouver's 2005 Emission Inventory (Metro Vancouver, 2007), which contains monthly emission factors for 6 different building types. Emission factors were multiplied by the number of dwellings or value of construction built, the assumed number of months of construction, and an average size of building as shown in Table 37. The number of dwellings or value of construction built for each of the 6 building types was extracted from the 2015 Building Permit data from BC Statistics (BC Stats, 2016) as shown in Table 38.

Table 37: Factors for Emissions of Construction Dust

Item	Unit	Conversion Factor (ha/unit)	Duration	Adjusted EF (tonnes TPM and PM_{10}/ha-month)	Adjusted EF (tonnes $PM_{2.5}$/ ha-month)
Single-detached	Dwellings	0.067	4.2	0.014	0.0028
Duplex/Row	Dwellings	0.067	4.2	0.014	0.0028
Apartment	Dwellings	0.02	12	0.049	0.0098
Commercial	$ million	0.55	11	0.085	0.017
Industrial	$ million	0.55	11	0.085	0.017
Institutional	$ million	0.27	11	0.085	0.017

Table 38: Building Permits in Comox Valley Regional District in 2015

Building Types (Units)	Value or Number of Buildings Permitted
Industrial ($000)	4,478
Institutional and Government ($000)	43,070
Commercial ($000)	13,905
Residential Units (total #)	370
Residential Units -single dwelling (#)	163
Residential Units- Row (#)	3
Residential Units- Apartments (#)	195

2.4.3 Landfills

Emissions of fugitive dust from landfills from the BC emissions inventory (Environment and Climate Change Canada, 2016) were scaled based on the total volume of waste predicted and reported from the CEEI for 2010. The 2014 BC emissions inventory reported: 192,022 tonnes of TPM; 57,635 tonnes of PM_{10}; and, 11,542 tonnes of $PM_{2.5}$ for all of BC. The CEEI estimated that 2,386,715 tonnes of solid waste was produced in BC in 2010, and 44,224 tonnes of solid waste was produced in the CVRD in 2010.

2.5 Road Dust

Road Dust emissions are presented in a separate section of this report, in keeping with current emission inventory trends. Fugitive dust from paved and unpaved roads results from traffic movements which suspend material into the atmosphere. Current methods for estimating emissions of road dust include a large degree of uncertainty as estimates are based on a number of site-specific variables which are not known with any certainty without extensive field measurements. Particulate matter that is suspended on roads is typically crustal matter of larger size fractions (e.g., > 44 µm). The largest particles tend to settle out within the first 100 m of the roadway, which provides inherent mitigation of about 75% of emissions (Desert Research Institute 2000). For this reason, road dust emissions are typically highly conservative.

Emissions from paved and unpaved roads were provided by the BC emissions inventory (Environment and Climate Change Canada, 2016) in three categories: tire wear and brake lining; dust from paved roads; and, dust from unpaved roads (see Table 39). The 2014 BC emissions inventory estimates for paved and unpaved roads were scaled from a BC total to the using the predicted fuel consumption from the 2010 CEEI reports for BC as shown in Table 40. Fuel consumption for all vehicle classes and all fuel type combinations from the CEEI were summed to Provincial and regional totals and used to scale emissions from tire wear and brake lining and dust from paved roads. Consumption of diesel fuel was used to scale dust from unpaved roads.

Table 39: 2014 BC Road Dust Emissions

Emission Source	BC 2014 Emission Category	2014 BC Emissions (tonnes)		
		TPM	PM_{10}	$PM_{2.5}$
Paved & Unpaved Roads	Tire wear & Brake Lining	772	772	189
	Dust from Paved Roads	551,352	105,677	25,350
	Dust from Unpaved Roads	347,436	118,543	17,118
Total Road Dust		**899,560**	**224,992**	**42,657**

Table 40: Road Dust Emission Scaling Surrogates

Emission Source	BC 2014 Emission Category	Fuel Consumption (L)		Fuel Type Included
		BC	Comox Valley	
Paved & Unpaved roads	Tire Wear & Brake Lining	5,894,855,894	83,962,333	All fuel
	Dust from Paved Roads			
	Dust from Unpaved Roads	1,321,549,546	12,260,174	Diesel fuel

3 RESULTS

3.1 All Sources

Emissions of TPM, PM_{10}, and $PM_{2.5}$ by source and source sector for 2015 for the CVRD are shown in Table 41. Annual emissions of TPM, PM_{10}, and $PM_{2.5}$ from all sources (excluding road dust) are estimated to be 901, 727, and 608 tonnes, respectively. The relative proportions of TPM, PM_{10}, and $PM_{2.5}$ by major emission source category excluding fugitive dust are shown Figure 5, Figure 6 ,and Figure 7, respectively.

Table 41: Particulate Matter Emissions for the CVRD

Emission Source			2015 Emissions (tonnes per year)		
			TPM	PM_{10}	$PM_{2.5}$
Point	Industrial Sources		1.6	0.6	0.2
	Point Subtotal		***1.6***	***0.6***	***0.2***
Area	Space Heating	Natural Gas - Residential	1.2	1.2	1.2
		Natural Gas - Commercial/Industrial	1.0	1.0	1.0
		Propane	0.2	0.2	0.2
		Wood	225.6	213.0	212.8
		Heating Oil	0.5	0.5	0.5
		Space Heating Subtotal	***228.5***	***215.9***	***215.7***
	Agricultural	Synthetic Fertilizer Application	0.2	0.1	0.03
		Tilling	35.5	35.5	7.5
		Harvesting	0.3	0.3	0.05
		Wind Erosion	51.1	25.6	3.8
		Livestock movements	4.1	1.2	0.2
		Crop Residue Burning	0.9	0.8	0.8
		Agricultural Subtotal	***92.1***	***63.6***	***12.4***
	Open Burning	Provincially Regulated - Pile	348.9	247.8	215.9
		Provincially Regulated - Area	57.5	42.4	36.7
		Municipally Regulated - Pile	6.2	4.8	4.1
		Recreational Fires	0.01	0.01	0.009
		Regional/Municipal - Backyard Burns	17.2	17.2	17.2
		Wildfire	3.5	2.6	2.4
		Open Burning Subtotal	***433.4***	***314.8***	***276.2***
	Miscellaneous	Meat Cooking	15.5	15.5	15.5
		Cigarettes	0.5	0.5	0.5
		Dry Cleaning	0.01	0.01	0.01
		Crematorium	0.01	0.01	0.01
		Structural Fires	0.3	0.3	0.3
		Miscellaneous Subtotal	***16.4***	***16.4***	***16.4***
	Area Subtotal		***770.3***	***610.7***	***520.7***
Mobile	On-road	Light-duty	11.6	11.6	10.8
		Heavy-duty vehicles	10.4	10.4	10.0
	Non-road vehicles		34.1	33.7	32.6
	Marine Vessels		19.4	19.4	17.8
	Aircraft		3.3	3.3	3.0
	Mobile Subtotal		***78.7***	***78.3***	***74.1***
Fugitive Dust	Industrial Sources		3.7	1.1	0.1
	Construction Operations		23.3	23.3	4.7
	Landfills		22.8	12.6	8.4
	Fugitive Dust Subtotal		***49.8***	***36.9***	***13.1***
Total (no road dust)			***900.5***	***726.5***	***608.1***
Paved and unpaved roads			11,087.3	2,615.9	522.6
Total (with Road dust)			***11,987.8***	***3,342.4***	***1,130.7***

Notes: Totals may not equal the sum of components due to rounding.

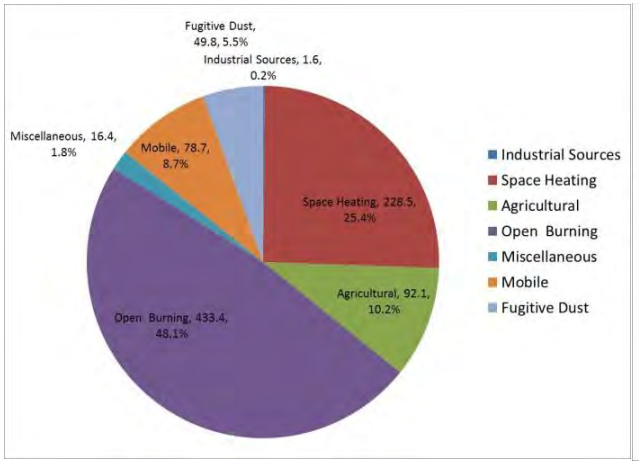


Figure 5: TPM Emissions for the CVRD, tonnes (not including Road Dust)

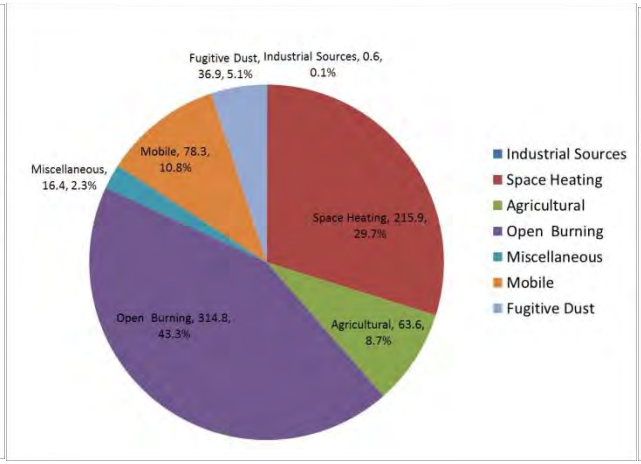


Figure 6: PM_{10} Emissions for the CVRD, tonnes (not including Road Dust)

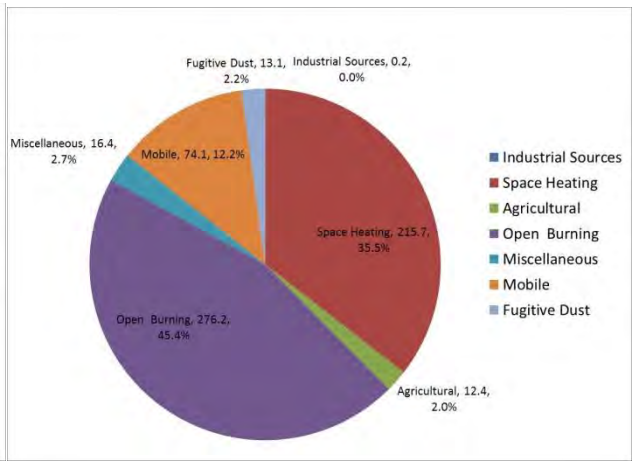


Figure 7: $PM_{2.5}$ Emissions for the CVRD, tonnes (not including Road Dust)

3.2 Industrial Sources

Emissions from industrial sources are shown in Table 42.

Table 42: Particulate Matter Emissions from Industrial Sources

Emission Source		2015 Emissions (tonnes per year)		
		TPM	PM_{10}	$PM_{2.5}$
Point	Tayco Paving Company	1.51	0.65	0.23
	Trueline Masonry and Landscape Products td.	0.01	-	-
	Hyland Precast Inc.	0.07	-	-
Total		***1.59***	***0.65***	***0.23***

3.3 Area Sources

Emissions from area sources by source and type are shown in Table 43. Emissions from wood used for space heating and provincially regulated pile burns make up the majority of the area source emissions, contributing 25% and 48% of the TPM, respectively. The relative proportions of TPM, PM_{10}, and $PM_{2.5}$ emissions from area sources by emission source category are shown Figure 8, Figure 9, and Figure 10, respectively

Table 43: Particulate Matter Emissions from Area Sources

Emission Source			2015 Emissions (tonnes per year)		
			TPM	PM_{10}	$PM_{2.5}$
Area	Space Heating	Natural Gas - Residential	1.2	1.2	1.2
		Natural Gas - Commercial/Industrial	1.0	1.0	1.0
		Propane	0.2	0.2	0.2
		Wood	225.6	213.0	212.8
		Heating Oil	0.5	0.5	0.5
		Space Heating Subtotal	***228.5***	***215.9***	***215.7***
	Agricultural	Synthetic Fertilizer Application	0.2	0.1	0.03
		Tilling	35.5	35.5	7.5
		Harvesting	0.3	0.3	0.05
		Wind Erosion	51.1	25.6	3.8
		Livestock movements	4.1	1.2	0.2
		Crop Residue Burning	0.9	0.8	0.8
		Agricultural Subtotal	***92.1***	***63.6***	***12.4***
	Open Burning	Provincially Regulated - Pile	348.9	247.8	215.9
		Provincially Regulated - Area	57.5	42.4	36.7
		Municipally Regulated - Pile	6.2	4.8	4.1
		Recreational Fires	0.01	0.01	0.009
		Regional/Municipal - Backyard Burns	17.2	17.2	17.2
		Wildfire	3.5	2.6	2.4
		Open Burning Subtotal	***433.4***	***314.8***	***276.2***
	Miscellaneous	Meat Cooking	15.5	15.5	15.5
		Cigarettes	0.5	0.5	0.5
		Dry Cleaning	0.01	0.01	0.01
		Crematorium	0.01	0.01	0.01
		Structural Fires	0.3	0.3	0.3
		Miscellaneous Subtotal	***16.4***	***16.4***	***16.4***
	Area Subtotal		***770.3***	***610.7***	***520.7***

Note: Totals may not equal the sum of components due to rounding.

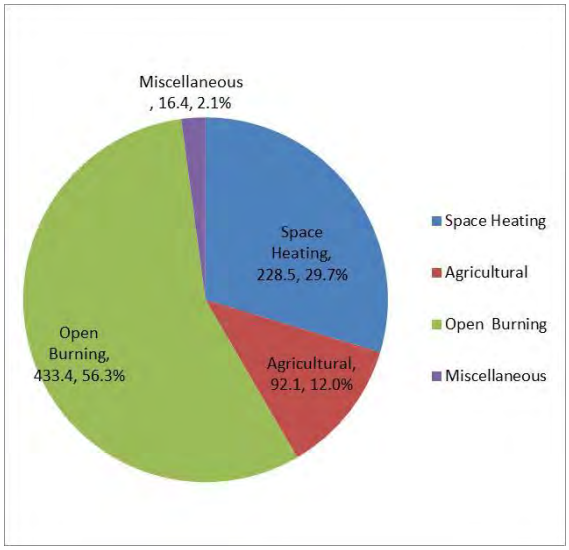


Figure 8: TPM Emissions from Area sources in the CVRD, tonnes

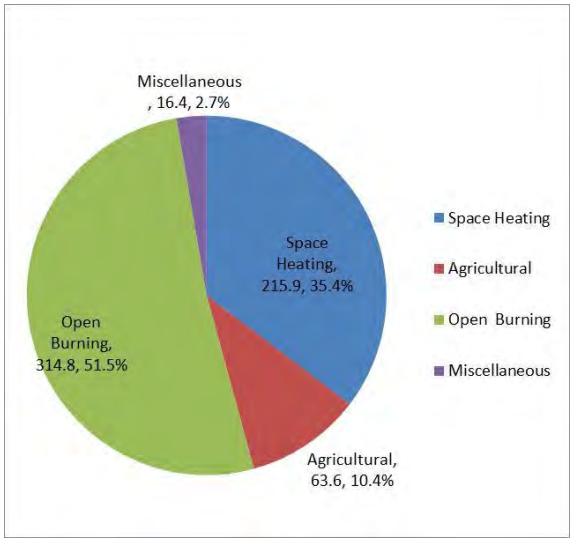


Figure 9: PM_{10} Emissions from Area Sources in the CVRD, tonnes

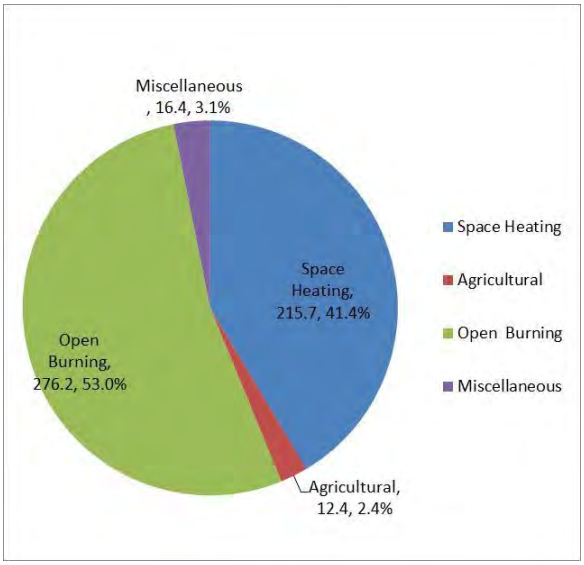


Figure 10: $PM_{2.5}$ Emissions from Area Sources in the CVRD, tonnes

3.3.1 Space Heating

Space heating emissions by fuel type are shown in Table 44, Emissions from wood burning equipment are listed in Table 45.

Table 44: Particulate Matter Emissions from Space Heating Sources by Fuel Type

Emission Source		2015 Emissions (tonnes per year)		
		TPM	PM_{10}	$PM_{2.5}$
Space Heating	Natural Gas - Residential	1.2	1.2	1.2
	Natural Gas - Commercial/Industrial	1.0	1.0	1.0
	Propane	0.2	0.2	0.2
	Wood	225.6	213.0	212.8
	Heating Oil	0.5	0.5	0.5
	Space Heating Total	***228.5***	***215.9***	***215.7***

Table 45: Particulate Matter Emissions from Wood Burning Equipment (tonnes per year)

Appliances Type	Fireplace; Advanced	Fireplace; Conventional Without glass doors	Central Furnace/Boiler (inside)	Central Furnace/Boiler	Central Furnace/Boiler (outside)	Fireplace Insert; Advanced Technology	Fireplace Insert; Catalytic	Fireplace Insert; Conventional	Woodstove; Advanced	Woodstove; Catalytic	Woodstove; Conventional	Pellet	Total Wood burning Equipment
TPM	9.5	34.4	8.5	0.1	2.2	17.2	1.6	34.0	66.8	2.0	44.9	4.3	***225.6***
PM_{10}	9.0	33.0	8.0	0.1	2.0	16.2	1.5	32.1	62.9	1.9	42.3	4.0	***213.0***
$PM_{2.5}$	9.0	32.8	8.0	0.1	2.0	16.2	1.5	32.1	62.9	1.9	42.3	4.0	***212.8***

Note: Totals may not equal the sum of components due to rounding.

3.3.2 Agricultural Sources

Emissions from agricultural sources are shown in Table 46.

Table 46: Particulate Matter Emissions from Agricultural Area Sources by Emission Sources and CCS

Emission Source			2015 Emissions (tonnes per year)		
			TPM	PM_{10}	$PM_{2.5}$
Agricultural	Synthetic Fertilizer Application	Comox Valley A	0.04	0.02	0.01
		Comox Valley B Lazo North	0.03	0.01	0.00
		Comox Valley C Puntledge - Black Creek	0.14	0.07	0.02
	Synthetic Fertilizer Application Subtotal		***0.21***	***0.10***	***0.03***
	Tilling	Comox Valley A	7.71	7.71	1.62
		Comox Valley B Lazo North	5.65	5.65	1.19
		Comox Valley C Puntledge - Black Creek	22.14	22.14	4.65
	Tilling Subtotal		***35.50***	***35.50***	***7.45***
	Harvesting	Comox Valley A	0.10	0.10	0.02
		Comox Valley B Lazo North	0.04	0.04	0.01
		Comox Valley C Puntledge - Black Creek	0.16	0.16	0.02
	Harvesting Subtotal		***0.31***	***0.31***	***0.05***
	Wind Erosion	Comox Valley A	5.83	2.91	0.44
		Comox Valley B Lazo North	5.49	2.74	0.41
		Comox Valley C Puntledge - Black Creek	39.82	19.91	2.99
	Wind Erosion Subtotal		***51.13***	***25.57***	***3.83***
	Livestock movements	Comox Valley A	0.71	0.22	0.03
		Comox Valley B Lazo North	0.56	0.19	0.03
		Comox Valley C Puntledge - Black Creek	2.79	0.83	0.13
	Livestock movements Subtotal		***4.07***	***1.24***	***0.20***
	Crop Residue Burning	Comox Valley A	0.17	0.17	0.16
		Comox Valley B Lazo North	0.08	0.08	0.07
		Comox Valley C Puntledge - Black Creek	0.61	0.60	0.57
	Crop Residue Burning Subtotal		***0.86***	***0.85***	***0.81***
Agricultural Total			***92.08***	***63.55***	***12.37***

Note: **Totals may not equal the sum of components due to rounding**

3.3.3 Open Burning

Emissions from open burning sources are shown in Table 47 and illustrated in Figure 11.

Table 47: Particulate Matter Emissions from Open Burning Sources by Emission Sources and CCS

Emission Source			2015 Emissions (tonnes per year)		
			TPM	PM_{10}	$PM_{2.5}$
Open Burning	Provincially Regulated - Pile	Class A	340.2	241.3	210.3
		Class B	6.19	4.58	3.89
		Class C	2.47	1.92	1.64
		Provincially Regulated - Pile Subtotal	***348.9***	***247.8***	***215.9***
	Provincially Regulated - Area	Area	57.5	42.4	36.7
		Provincially Regulated - Area Subtotal	***57.5***	***42.4***	***36.7***
	Municipally Regulated - Pile	***Municipally Regulated - Pile Subtotal***	***6.2***	***4.8***	***4.1***
	Recreational Fires	***Recreational Fires Subtotal***	***0.01***	***0.01***	***0.009***
	Backyard Burning	Yard Waste	11.9	3.77	3.77
		Clean Wood Waste	1.1	0.04	0.04
		Cut Grass & Raked Leaves	4.2	0.14	0.14
		Backyard Burning Subtotal	***17.2***	***3.9***	***3.9***
	Wildfire	Wildfire subtotal	3.53	2.55	2.36
		Wildfire Subtotal	***3.53***	***2.55***	***2.36***
Open Burning Total			***433.4***	***314.8***	***276.2***

Note: Totals may not equal the sum of components due to rounding.

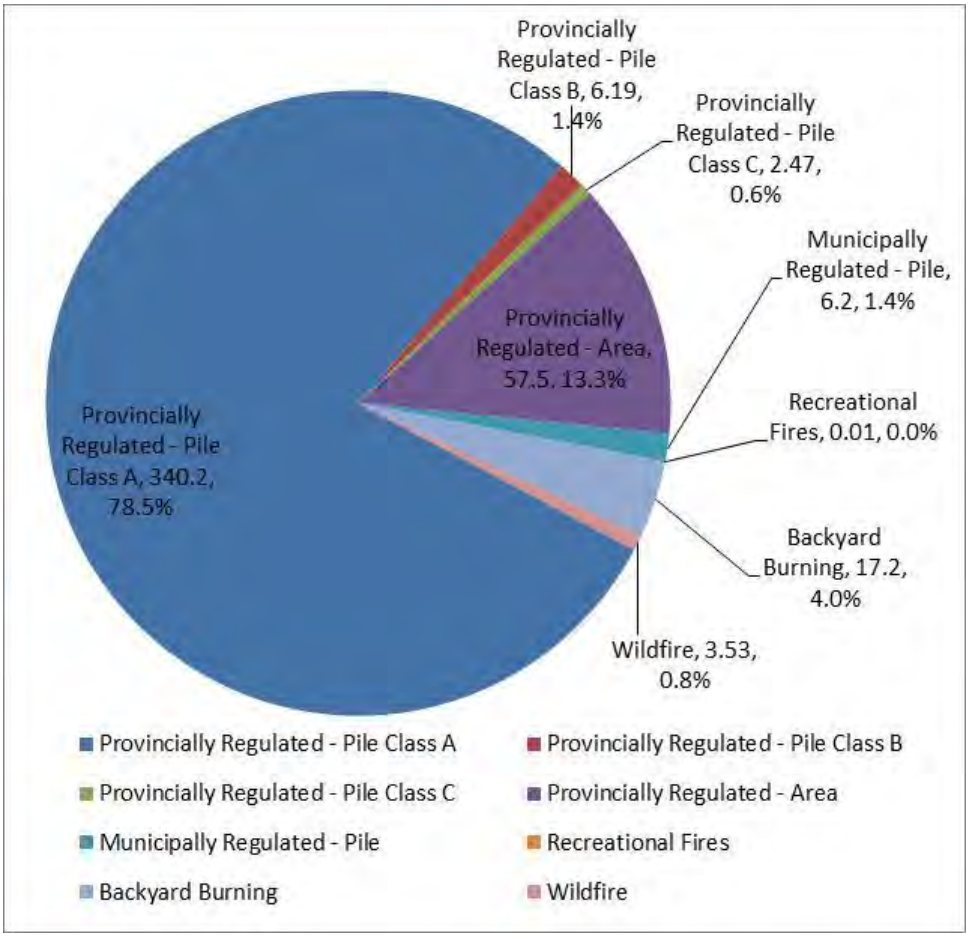


Figure 11: Particulate Matter Emissions from Open Burning Sources in the CVRD, tonnes

3.3.4 Miscellaneous Sources

Emissions from miscellaneous sources are shown in Table 48.

Table 48: Particulate Matter Emissions from Miscellaneous Sources

Emission Source		2015 Emissions (tonnes per year)		
		TPM	PM_{10}	$PM_{2.5}$
Miscellaneous	Meat Cooking	15.5	15.5	15.5
	Cigarettes	0.5	0.5	0.5
	Dry Cleaning	0.0	0.0	0.0
	Crematorium	0.0	0.0	0.0
	Structural Fires	0.3	0.3	0.3
	Miscellaneous Subtotal	***16.4***	***16.4***	***16.4***

3.4 Mobile

Emissions from mobile sources by source are shown in Table 49. Emissions from mobile sources collectively contribute only 7.4% of the TPM in the CVRD (excluding fugitive dust).

Table 49: Particulate Matter Emissions from Mobile Sources

Emission Source			2015 Emissions (tonnes per year)		
			TPM	PM_{10}	$PM_{2.5}$
Mobile	On-road	Light-Duty	11.58	11.58	10.75
		Heavy-Duty Vehicles	10.38	10.38	10.03
	Non-Road Vehicles		34.07	33.66	32.56
	Marine Vessels		19.4	19.4	17.8
	Aircraft		3.29	3.29	2.96
	Mobile Subtotal		***78.7***	***78.3***	***74.1***

3.5 Fugitive Dust

Emissions from fugitive sources by source are shown in Table 50.

Table 50: Particulate Matter Emissions from Fugitive Dust Sources

Emission Source		2015 Emissions (tonnes per year)		
		TPM	PM_{10}	$PM_{2.5}$
Fugitive Dust	Industrial Sources	3.7	1.1	0.1
	Construction Operations	23.3	23.3	4.7
	Landfills	22.8	12.6	8.4
	Fugitive Dust Subtotal	***49.8***	***36.9***	***13.1***

Note: Totals may not equal the sum of components due to rounding.

3.6 Road Dust

Emissions of from road dust are shown in Table 51. Emissions from fugitive dust (shown in Table 52) contribute to 93% of the TPM, 80% of the PM_{10}, and 47% of the $PM_{2.5}$.

Table 51: Particulate Matter Emissions from Fugitive Dust Sources

Emission Source		2015 Emissions (tonnes per year)		
		TPM	PM_{10}	$PM_{2.5}$
Road Dust	Paved & Unpaved Roads	11,087.3	2,615.9	522.6

Table 52: Particulate Matter Emissions from Fugitive Dust and Other Sources

Emission Source	2015 Emissions (tonnes per year)		
	TPM	PM_{10}	$PM_{2.5}$
Point	1.6	0.6	0.2
Area	770.3	610.7	520.7
Mobile	78.7	78.3	74.1
Fugitive Dust	49.8	36.9	13.1
Total (no Road dust)	***900.5***	***726.5***	***608.1***
Road Dust	11,087.3	2,615.9	522.6
Total (with Road dust)	***11,987.8***	***3,342.4***	***1,130.7***

Note: Totals may not equal the sum of components due to rounding.

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APPENDIX 1: DETAILED AGRICULTURAL EMISSIONS INVENTORY METHOD

4.1 Agricultural Sources

Particulate matter is produced from agricultural activities including the addition of synthetic fertilizers, tilling and harvesting of crops, wind erosion on fields, livestock husbandry, and the use of agricultural on- and non-road vehicles and equipment. Agricultural non-road vehicles and equipment has been discussed in section 2.3.2.

The Canadian Census of Agriculture provides the land in crops by crop type and the head of livestock (on a particular date) by Census Consolidated subdivision (CCS) every five years. The most current Census of Agriculture is from 2011, the 2016 Census data are not expected to be available until 2017 at the earliest. The base quantities used for the emissions from agricultural sources in this inventory were all extracted from the 2011 Census of Agriculture for the CCSs for Comox Valley: Comox Valley A (5926021), Comox Valley B (Lazo North) (5926022), and Comox Valley C (Puntledge - Black Creek) (5926024). Census consolidated subdivisions (CCSs) within the CVRD are shown in Figure 12.

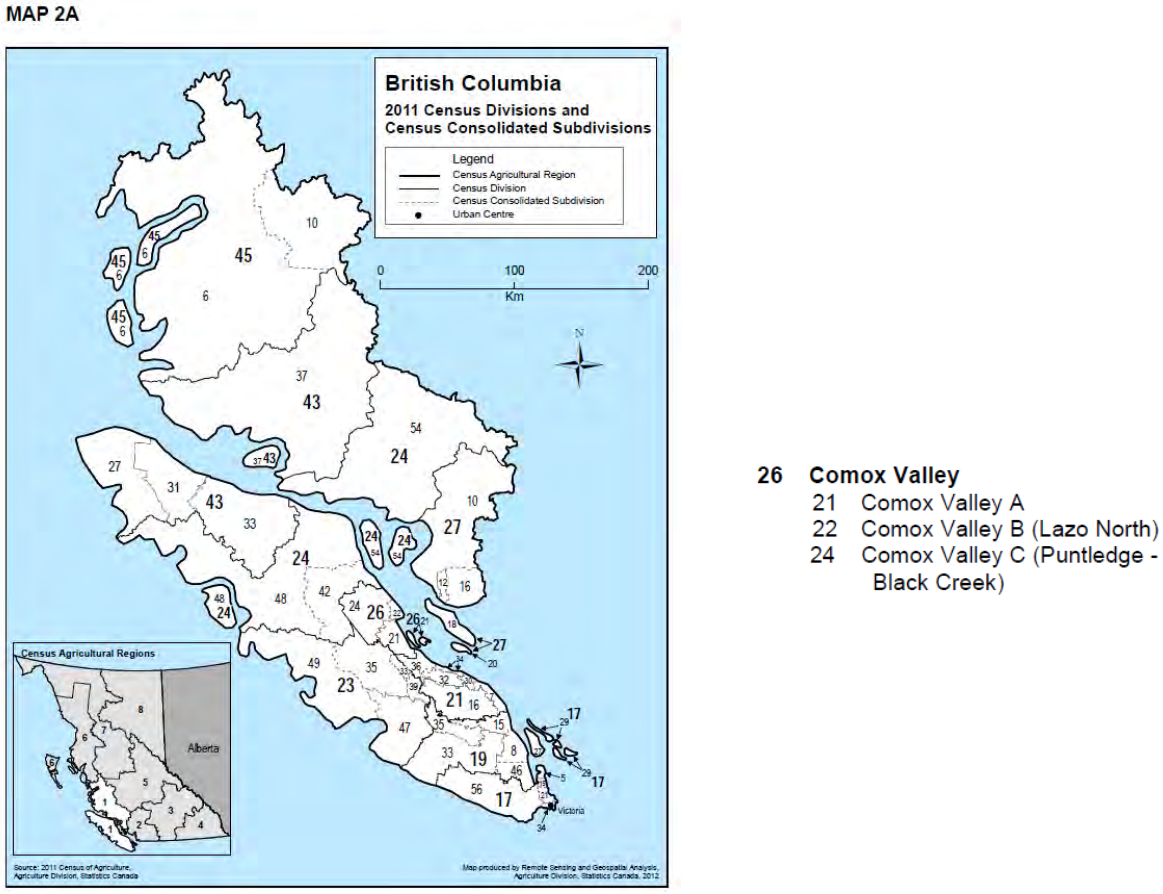

Figure 12: BC Census Division 1 (Vancouver Island-Coast) Showing Consolidated Subdivisions and the CVRD.

4.1.1 Synthetic Fertilizer Application

Particulate emissions were based on the method used by Environment Canada to calculate PM emissions from fertilizer application as part of the national emissions inventory. The emissions of PM are based on the quantity of fertilizer applied with global emission factors that account for the handling and storage as well as the spreading of fertilizers (Environment Canada, 2006). The general emission equation is shown in Equation 16. PM emission factors per tonne of fertilizer applied are shown in Table 53. The amount of fertilizer applied (summed per crop type) is equal to the area of land per crop multiplied by a fertilizer application density which varies by crop.

Equation 16: Particulate Matter Emissions from Fertilizer Application

$$PM\ Emissions\ (kg) = Area\ of\ land\ per\ crop\ (hectare) \times Amount\ of\ Fertilizer\ applied\ per\ crop\ \left(\frac{kg}{ha}\right) \times PM\ Emission\ Factor\ \left(\frac{kg}{tonne}\right)$$

Table 53: Particulate Matter Emission Factors for Fertilizer Application

Pollutant	Emission Factor (kg/t Fertilizer)
PM	2.23
PM_{10}	1.09
$PM_{2.5}$	0.31

A detailed method for estimating monthly emissions of ammonia from fertilizer application was developed by Sheppard *et al.* (Sheppard, Bittman, & Bruulsema, 2009). This method includes calculating the fertilizer application rate for 37 different crop types by four different fertilizer solution groupings (15 of these crop types are relevant to the CVRD). The work completed by Sheppard *et al.* (Sheppard, Bittman, & Bruulsema, 2009) used fertilizer sales data from the Canadian Fertilizer Institute (CFI) to partition nitrogen fertilizer amounts into four main forms: urea, nitrogen solutions (typically urea ammonium nitrate), anhydrous ammonia, and 'others'. The fertilizer application rate by census crop and fertilizer type are shown in Table 54 and the crop area by CCS is shown in Table 55.

Table 54: Fertilizer Application Density by Census Crop and Fertilizer Type

Census Field	Fertilizer Application Rates (kg/ha)			
	Anhydrous	Other	UAN	Urea
Alfalfa_and_alfalfa_mixtures_hectares	0.28	0.54	0.00	1.44
Blueberries_total_area_hectares	26.24	50.43	0.02	134.36
Carrots_hectares	31.46	60.47	0.02	161.12
Census_All_131_Barley_hectares	21.08	40.52	0.01	107.95
Corn_for_silage_hectares	14.07	27.05	0.01	72.07
Fall_rye_hectares	10.39	19.98	0.01	53.23
Green peas_hectares	15.73	30.24	0.01	80.56
Mixed_grains_hectares	17.30	33.26	0.01	88.62
Other vegetables 48_hectares	13.62	26.19	0.01	69.77
Potatoes_hectares	20.20	38.82	0.01	103.43
Raspberries_total_area_hectares	19.07	36.66	0.01	97.68
Spring_rye_hectares	10.39	19.98	0.01	53.23
Spring_wheat_excluding_durum_hectares	21.39	41.12	0.01	109.56
Sweet corn_hectares	35.11	67.49	0.02	179.82
Tomatoes_hectares	41.85	80.45	0.03	214.35

Table 55: Crop Area by CCS and Crop Type

Census Crop	Crop Area by CCS (ha)		
	Comox Valley A	Comox Valley B Lazo North	Comox Valley C Puntledge – Black Creek
Alfalfa_and_alfalfa_mixtures_hectares	284.0	83.0	197.0
All_other_tame_hay_and_fodder_crops_hectares	412.0	183.0	1977.0
Blueberries_total_area_hectares	4.0	2.0	15.0
Carrots_hectares	1.0	1.0	0.0
Census_All_131_Barley_hectares	0.0	30.0	84.0
Corn_for_silage_hectares	74.7	0.0	261.3
Fall_rye_hectares	23.0	0.0	23.0
Forage_seed_for_seed_hectares	0.0	0.0	243.0
Green peas_hectares	1.0	0.0	0.0
Mixed_grains_hectares	5.0	0.0	0.0
Oats_hectares	4.8	0.0	14.3
Other vegetables 48_hectares	7.0	1.0	3.0
Potatoes_hectares	1.0	26.9	67.1
Raspberries_total_area_hectares	1.0	1.0	10.0
Spring_rye_hectares	13.0	0.0	0.0
Spring_wheat_excluding_durum_hectares	0.0	0.0	1.0
Sweet corn_hectares	11.5	3.5	4.0
Tomatoes_hectares	1.0	0.0	1.0

The method used by Environment Canada is based on a technique for Phosphorous-based fertilizers developed in 1973. Environment Canada is one of the few agencies that incudes PM from fertilizer application in their emissions inventory. The US EPA currently states that "emission factors are not presently available for PM" (*from fertilizer application*) (US EPA, 1995).

4.1.2 Tilling

Particulate matter is released from the disturbance of soils during the tilling of fields and harvesting of crops. The EPA method for agricultural tilling was used with local improvements (Poon & Robbins, 2006). Tilling emissions are dependent on crop-specific and region-specific factors. Crop-specific factors including the area tilled and the number of tills per year (often expressed as the years between renovations). Region-specific factors include the moisture reduction factor (an expression of the local precipitation pattern) and the local silt content.

The general emission equation is shown in Equation 17. Emissions of PM, PM_{10}, and $PM_{2.5}$ are calculated per crop type and per season. Emissions are based on the crop area (in hectares), the number of tillings (passes), and an emission factor calculated specifically for the region and season. The area per crop for each CCS is shown in Table 56.

Equation 17: Tilling Emission Equation

$$Emissions\ per\ crop\ per\ season\ _{(PM,PM_{10},PM_{2.5})} = Area\ per\ crop\ (ha) \times Number\ of\ tillings\ per\ crop\ and\ per\ season\ \times Emission\ Factor_{(PM,PM_{10},PM_{2.5})} \times Tillage\ Factor(unitless)$$

Table 56: Crop Area by CCS and Crop Type for Tilling and Harvesting

Census Crop	Crop Area by CCS (ha)		
	Comox Valley A	Comox Valley B Lazo North	Comox Valley C Puntledge – Black Creek
Alfalfa_and_alfalfa_mixtures_hectares	284.0	83.0	197.0
All_other_tame_hay_and_fodder_crops_hectares	412.0	183.0	1977.0
Apples_total_area_hectares	12.0	7.0	4.0
Beets_hectares	0.0	1.0	0.0
Blueberries_total_area_hectares	4.0	2.0	15.0
Broccoli_hectares	0.0	2.0	0.0
Cabbage_hectares	0.0	0.3	0.7
Carrots_hectares	1.0	1.0	0.0
Cauliflower_hectares	1.3	0.7	0.0
Census_All_131_Barley_hectares	0.0	30.0	84.0
Census_All_131_Total_corn_44_hectares	74.7	0.0	261.3
Cherries_sweet_total_area_hectares	0.0	0.3	1.7
Corn_for_silage_hectares	74.7	0.0	261.3
Cranberries_total_area_hectares	5.3	16.0	10.7
Cucumbers_hectares	0.0	0.0	1.0
Dry onions yellow Spanish cooking etc _hectares	1.0	0.0	0.0
Fall_rye_hectares	23.0	0.0	23.0
Forage_seed_for_seed_hectares	0.0	0.0	243.0
Grapes_total_area_hectares	7.0	13.0	5.0
Green peas_hectares	1.0	0.0	0.0
Lettuce_hectares	2.4	0.6	1.0
Mixed_grains_hectares	5.0	0.0	0.0
Oats_hectares	4.8	0.0	14.3
Other vegetables 48_hectares	7.0	1.0	3.0
Other_field_crops_46_hectares	2.3	0.0	0.8
Other_fruits_berries_and_nuts_total_area_47_hectares	14.0	2.0	42.0
Pears_total_area_hectares	2.0	2.0	1.0
Peppers_hectares	0.0	0.0	1.0
Plums_and_prunes_total_area_hectares	1.0	2.0	0.0
Potatoes_hectares	1.0	26.9	67.1
Pumpkins_hectares	2.0	0.7	0.3
Raspberries_total_area_hectares	1.0	1.0	10.0
Saskatoons_total_area_hectares	0.5	0.0	0.5
Shallots and green onions_hectares	0.0	0.4	0.6
Spinach_hectares	0.8	0.3	0.0
Spring_rye_hectares	13.0	0.0	0.0
Spring_wheat_excluding_durum_hectares	0.0	0.0	1.0
Squash and zucchini_hectares	1.0	1.0	1.0
Strawberries_total_area_hectares	2.0	0.0	2.0
Sweet corn_hectares	11.5	3.5	4.0
Tomatoes_hectares	1.0	0.0	1.0
Total vegetables excluding greenhouse vegetables_hectares	19.0	28.0	16.0
Total_area_of_fruits_berries_and_nuts_hectares	43.0	57.0	85.0
Total_rye_45_hectares	0.7	0.0	0.3
Total_wheat_43_hectares	0.0	0.0	2.0

The number of tills per crop is based on the census agricultural region and the month. The number of tills (passes) for each region has been developed with expertise from Ministry of Agriculture staff as part of the BC Agricultural Air Emissions Inventory (RWDI, 2014). The number of tills per month is shown in Table 57**Error! Reference source not found.**, no tilling is done in January or December. The number of tills per season were provided by BC Ministry of Agriculture staff and divided over the months within the season or year. The tillage factor is assumed to 100% minus the percentage of area managed with no-till or zero-till practices. For the CVRD, the tillage factor was set to 76%.

Table 57: Tilling Practices per Season by Crop Category for Vancouver Island

Census Crop	Number of Tills per month									
	February	March	April	May	June	July	August	September	October	November
Alfalfa_and_alfalfa_mixtures_hectares	0.25	0.25	0.25	0.25	0.00	0.00	0.00	0.13	0.13	0.13
Apples_total_area_hectares	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Apricots_total_area_hectares	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Asparagus non-producing_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Asparagus producing_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Beets_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Blueberries_total_area_hectares	0.22	0.22	0.22	0.22	0.00	0.00	0.00	0.00	0.00	0.00
Broccoli_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Brussels sprouts_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Buckwheat_hectares	0.63	0.63	0.63	0.63	0.00	0.00	0.00	0.50	0.50	0.50
Cabbage_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Canary_seed_hectares	0.25	0.25	0.25	0.25	0.00	0.00	0.00	0.13	0.13	0.13
Canola_rapeseed_hectares	0.63	0.63	0.63	0.63	0.00	0.00	0.00	0.50	0.50	0.50
Caraway_seed_hectares	0.63	0.63	0.63	0.63	0.00	0.00	0.00	0.50	0.50	0.50
Carrots_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Cauliflower_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Celery_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Census_All_131_Barley_hectares	0.63	0.63	0.63	0.63	0.00	0.00	0.00	0.50	0.50	0.50
Census_All_131_Total_corn_44_hectares	0.75	0.75	0.75	0.75	0.00	0.00	0.00	0.25	0.25	0.25
Cherries_sour_total_area_hectares	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Cherries_sweet_total_area_hectares	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Chick_peas_hectares	1.25	1.25	1.25	1.25	1.00	1.00	1.00	0.00	0.00	0.00
Chinese cabbage_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Cucumbers_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Dry onions yellow Spanish cooking etc hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67

Census Crop	Number of Tills per month									
	February	March	April	May	June	July	August	September	October	November
Dry_field_peas_hectares	1.25	1.25	1.25	1.25	1.00	1.00	1.00	0.00	0.00	0.00
Dry_white_beans_hectares	1.25	1.25	1.25	1.25	1.00	1.00	1.00	0.00	0.00	0.00
Durum_wheat_hectares	0.25	0.25	0.25	0.25	0.00	0.00	0.00	0.13	0.13	0.13
Fall_rye_hectares	0.63	0.63	0.63	0.63	0.00	0.00	0.00	0.50	0.50	0.50
Flaxseed_hectares	0.63	0.63	0.63	0.63	0.00	0.00	0.00	0.50	0.50	0.50
Grapes_total_area_hectares	0.22	0.22	0.22	0.22	0.00	0.00	0.00	0.00	0.00	0.00
Green and wax beans_hectares	1.25	1.25	1.25	1.25	1.00	1.00	1.00	0.00	0.00	0.00
Green peas_hectares	1.25	1.25	1.25	1.25	1.00	1.00	1.00	0.00	0.00	0.00
Lentils_hectares	0.63	0.63	0.63	0.63	0.00	0.00	0.00	0.50	0.50	0.50
Lettuce_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Mixed_grains_hectares	0.63	0.63	0.63	0.63	0.00	0.00	0.00	0.50	0.50	0.50
Mustard_seed_hectares	0.63	0.63	0.63	0.63	0.00	0.00	0.00	0.50	0.50	0.50
Oats_hectares	0.63	0.63	0.63	0.63	0.00	0.00	0.00	0.50	0.50	0.50
Other vegetables 48_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Other_dry_beans_hectares	1.25	1.25	1.25	1.25	1.00	1.00	1.00	0.00	0.00	0.00
Other_field_crops_46_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Other_fruits_berries_and_nuts_total_area_47 _hectares	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Peaches_total_area_hectares	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Pears_total_area_hectares	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Peppers_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Plums_and_prunes_total_area_hectares	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Potatoes_hectares	1.25	1.25	1.25	1.25	1.00	1.00	1.00	0.00	0.00	0.00
Pumpkins_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Radishes_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Raspberries_total_area_hectares	0.30	0.30	0.30	0.30	0.19	0.19	0.19	0.65	0.65	0.65
Rutabagas and turnips_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67

Census Crop	Number of Tills per month									
	February	March	April	May	June	July	August	September	October	November
Shallots and green onions_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Soybeans_hectares	1.25	1.25	1.25	1.25	1.00	1.00	1.00	0.00	0.00	0.00
Spinach_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Spring_rye_hectares	0.25	0.25	0.25	0.25	0.00	0.00	0.00	0.13	0.13	0.13
Spring_wheat_excluding_durum_hectares	0.63	0.63	0.63	0.63	0.00	0.00	0.00	0.50	0.50	0.50
Squash and zucchini_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Sugar_beets_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Sweet corn_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Tomatoes_hectares	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.67	0.67	0.67
Total_rye_45_hectares	0.63	0.63	0.63	0.63	0.00	0.00	0.00	0.50	0.50	0.50
Total_wheat_43_hectares	0.63	0.63	0.63	0.63	0.00	0.00	0.00	0.50	0.50	0.50
Triticale_hectares	0.63	0.63	0.63	0.63	0.00	0.00	0.00	0.50	0.50	0.50
Winter_wheat_hectares	0.63	0.63	0.63	0.63	0.00	0.00	0.00	0.50	0.50	0.50

The tillage emission factor equation is shown in Equation 5. The base equation includes an empirically derived constant (5.38) multiplied by a moisture reduction factor, particle size multiplier, and the silt content. The particle size multiplier is used to estimate the fraction of PM that is PM_{10} or $PM_{2.5}$. The particle size multiplier is typically assumed to be 0.21 for PM_{10} and 0.042 for $PM_{2.5}$.

Equation 18: Tilling Emission Factor Equation

$$Emission\ Factor_{(PM,PM_{10},PM_{2.5})} = 5.38 \times Moisture\ reduction\ factor\ per\ season \times Particle\ size\ multiplier_{(PM,PM_{10},PM_{2.5})} \times Silt\ content\ per\ region\ (\%)^{0.6}$$

The moisture reduction factor reflects the precipitation accumulation which decreases the likelihood of particles becoming airborne. Moisture reduction factors were generated by month for each of the eight agricultural regions (based on the Census of Agriculture regions) for the detailed agricultural emissions inventory for the MoA. The moisture reduction factors for Vancouver Island – Coast was used for the CVRD and are shown in Table 58.

Table 58: Moisture Reduction Factors for Tilling Emission Factor Equation

Month	Moisture Reduction Factor (unitless)
January	0.00
February	0.00
March	0.00
April	0.20
May	0.50
June	0.50
July	0.75
August	0.50
September	0.50
October	0.00
November	0.00
December	0.00

The silt content is a percentage based on typical soil type. The silt content values for each CCS were developed using data from the Soil Landscapes of Canada version 3.2, developed by Agriculture and Agri-Food Canada and shown in Table 12.

Table 59: Silt Content by CCS

CCS	Silt content (%)
Comox Valley A	35.0
Comox Valley B Lazo North	43.6
Comox Valley C Puntledge - Black Creek	48.4

4.1.3 Harvesting

Particulate emissions from crop production arise from soil cultivation and harvesting. Emissions depend on crop, soil type, cultivation method, and weather conditions before and while working. Environment Canada's national air emissions inventory includes emission quantities and methods for agricultural tilling and wind erosion, but does not specifically include particulate emissions from harvesting.

The emission method from the BC Agricultural Air Emissions Inventory (RWDI, 2014) was used for this inventory. The general emission equation is shown in Equation 19. It is assumed that each crop is harvested only once annually. The PM_{10} emission factors are shown in Table 60. The California Air Resources Board $PM_{2.5}$ to PM_{10} ratio of 0.15 for agricultural harvesting (Countess Environmental, 2006) was used to estimate $PM_{2.5}$. And total PM was assumed equal to PM_{10}. The area by crop type is provided inTable 56.

Equation 19: PM_{10} Emissions from Agricultural Harvesting

$$Emissions_{PM_{10}}(kg) = Annual\ crop\ area\ (ha) \times Number\ of\ harvests\ \times Emisison\ factor\ \left(\frac{kg}{ha}\right)$$

Table 60: PM_{10} Emission Factors for Harvesting by Crop Classification Groupings

Crop Classification Category Groupings	PM_{10} Emission Factor (kg/ha)
Corn	0.12
Grass/Hay/Alfalfa	0.25
Cereal, Grain & Oilseed	0.47
Pasture	0.00
Peas/Beans/Early Potatoes	0.31
All Other Vegetables	0.03
Turf	0.00
Tree Fruits Vines & Berries	0.01

4.1.4 Wind Erosion

Particulate emissions result from wind erosion of tilled agricultural lands. Particulate emissions from wind erosion of agricultural lands were calculated using the Wind Erosion Equation (WEQ) shown in Equation 20. The WEQ relies on crop-specific and region-specific factors. Crop specific factors include the surface roughness factor, the unsheltered field width factor and the vegetative factor. Crop-specific factors as developed for the BC Agricultural Air Emission inventory (RWDI, 2014) were used. Region-specific factors including the soil erodibility and climatic factor were developed readily for the Comox Valley.

Equation 20: Wind Erosion Equation

$$Emissions\ Factor_{PM_{10}}\ \left(\frac{ton}{acre\ year}\right) =$$
$$[Total\ suspended\ particulate\ portion\ (0.025)] \times I\ \left[Soil\ Erodibility\ \left(\frac{ton}{acre\ year}\right)\right] \times$$
$$K\ [Surface\ roughness\ factor] \times C\ [Climatic\ factor] \times L'^{[Unsheltered\ field\ width\ factor]} \times$$
$$V'[Vegetative\ cover\ factor]$$

Total PM was speciated to PM_{10} and $PM_{2.5}$ using factors from the WRAP Fugitive Dust Handbook (Countess Environmental, 2006). The PM_{10}/PM ratio for wind erosion is 0.5. The $PM_{2.5}$/PM_{10} ratio for windblown fugitive dust is 0.15.

s an aid in understanding the mechanics of this equation, the soil erodibility factor or “I”, may be thought of as the basic erodibility of a flat, very large, bare field in a climate highly conducive to wind erosion (i.e., high wind speeds and high temperature with little precipitation). This factor was initially established for the WEQ for a large, flat, bare field in Kansas that has relatively high winds along with hot summers and low precipitation. The parameters K, C, L’ and V’ may be thought of as reduction factors for a ridged surface, a climate less conducive to wind erosion, smaller-sized fields, and vegetative cover, respectively, to adjust the equation for applicability to field conditions that differ from the original Kansas field.

Individual land parcels were assigned soil textural classes (Table 61) using a standard soil texture triangle, shown in Figure 13 (Soil Classification Working Group, 2013) and soil erodibility factor, “I”, using GIS. The percentage of particles in three size groupings: silt, sand and clay were extracted from Agriculture and Agri-Food Canada’s Soil Landscapes of Canada National Soil DataBase (Agriculture and Agri-Food Canada, 2010). Area-weighted erodibility factors, “I”, were determined in GIS for each of the three CCSs and are shown in Table 61.

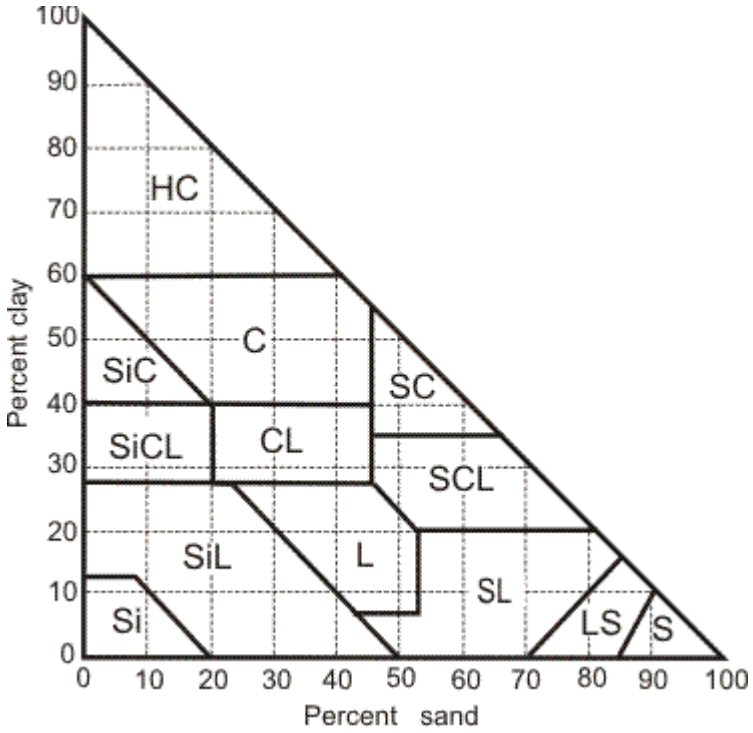

Figure 13: Soil Texture Triangle

Table 61: Soil Erodibility, I, for Various Soil Textural Classes

Predominant Soil Textural Class	Erodibility (tons/acre-year)
Sand	220
Loamy Sand	134
Sandy Loam, Clay, Silty Clay	86
Loam, Sandy Clay Loam, Sandy Clay	56
Silty Loam, Clay Loam	47
Silty Clay Loam, Silt	38

Table 62: Erodibility Factor, I per CCS

CCS	Erodibility factor (tons per year)
Comox Valley A	84
Comox Valley B Lazo North	65
Comox Valley C Puntledge - Black Creek	56

The surface roughness factor (K), unsheltered field width (L'), and vegetative cover (V') were assigned by crop type using values developed by the US EPA (US EPA, 1974), as shown in Table 63.

Table 63: Wind Erosion Variables by Crop (USA EPA, 1974)

Crop	K	L, ft.	V, lb/acre	L*, ft.
Alfalfa	1	1000	3000	250
Barley	0.6	2000	1100	500
Beans	0.5	1000	250	250
Corn	0.6	2000	500	500
Grain Hays	0.8	2000	1250	500
Oats	0.8	2000	1250	500
Potatoes	0.8	1000	400	250
Rye	0.6	2000	1250	500
Vegetables	0.6	500	100	125
Wheat	0.6	2000	1350	500

Monthly climatic factors, C, were taken from the BC Agricultural Air Emissions Inventory (RWDI, 2014) for Vancouver Island - Coast and are shown in Table 64.

Table 64: Wind Erosion Equation, Monthly climatic factor, C

Month	Climatic Factor, C
January	0
February	0
March	0
April	0.01
May	0.02
June	0.04
July	0.14
August	0.06
September	0.01
October	0
November	0
December	0

Total particulate matter (PM), PM_{10}, and $PM_{2.5}$ emissions are calculated using the monthly emission factors generated from Equation 7 multiplied times the area per crop. The area of each relevant crop was taken from the 2011 Census of Agriculture and is shown in Table 65.

Table 65: Crop Area by CCS for Wind Erosion Calculations

Wind Erosion Crop Grouping	Census Table	Census Fields	Crop Area (hectares)		
			Comox Valley A	Comox Valley B Lazo North	Comox Valley C Puntledge – Black Creek
Alfalfa	Hay and field crops 2011	Alfalfa_and_alfalfa_mixtures_hectares	284	83	197
Barley	Hay and field crops 2011	Barley_hectares	0		84
Grain Hays	Hay and field crops 2011	Mixed_grains_hectares		183	1977
		Canola_rapeseed_hectares			
		Flaxseed_hectares			
		All_other_tame_hay_and_fodder_crops_hectares			
Potatoes	Hay and field crops 2011	Potatoes_hectares	1		
Vegetables	Vegetables excluding greenhouse	Total vegetables excluding greenhouse vegetables_hectares	19	28	

4.1.5 Livestock Movements

Particulate emissions from animal production result from animal housing and moving facilities. The emissions methodology for PM from cattle, swine, poultry and horses was selected from the " Review of gricultural ir Emissions Estimates for the Lower Fraser Valley of British Columbia" (Poon & Robbins, 2006). The transfer of methodology from the LFV to CVRD assumes that agricultural livestock production operates similarly across the West Coast of BC. The number of livestock was taken from the 2011 Census of Agriculture and is shown in Table 66.

Table 66: Number of Livestock by CCS

Livestock	Number of Livestock (head)		
	Comox Valley A	Comox Valley B Lazo North	Comox Valley C Puntledge – Black Creek
Horses	74	19	255
Swine	97	71	603
Poultry	3,857	1,232	18,586
Cattle	48	63	112

The recommended method for cattle assumes that only cattle in beef feedlots generate significant PM and that the best conservative estimate of the number of cattle in beef feedlots is based on the number of beef steers. The number of steers was taken from the 2011 Census of Agriculture and is shown in Table 66

The published PM_{10} emission factor is 11 kg/1000 head/day, with particle size multipliers of 3.0 for PM and 0.15 for $PM_{2.5}$ resulting in the emission factors shown in Table 67. A climate correction factor of 0.572 was generated for the Comox Valley which is equal to fraction of days with less than 2.0 mm of rain in the region.

Equation 21: Particulate Matter Emissions from Cattle

$$PM_A = \frac{Number\ of\ Steers}{1000\ head} \times EF_{PM10,daily} \times Particle\ size\ multiplier_A \times climate\ correction\ factor \times days\ in\ feedlots\ (365)$$

Table 67: Particulate Matter Emission Factors for Cattle

Pollutant	Effective Emission Factor (kg/1000 steer/day)
PM	33
PM_{10}	11
$PM_{2.5}$	1.65

The recommended methodology for swine uses Equation 22 with a PM emission factor of 1.854 mg/hr/kg swine. PM_{10} to PM and $PM_{2.5}$ to PM ratios of 0.5 and 0.1 were used. The mass per animal is shown in Table 68.

Equation 22: Particulate Matter Emissions from Swine

$$PM = Number\ of\ swine\ (head) \times Mass\ per\ animal\ (\frac{kg}{head}) \times EF_{PM,hourly} \times Hours\ per\ year\ (8760) \times Particle\ size\ conversion$$

Table 68: Assumed Mass of Animal (Swine)

Census Livestock Category		Number of head	Mass per head kg/head
Swine	Boars_number	9	230
	Sows_and_gilts_for_breeding_number	80	170
	Nursing_and_weaner_pigs_number	270	47
	Grower_and_finishing_pigs_number	412	47

The recommended method for poultry depends on the length of production cycle and varies for pullets and laying hens versus broilers, turkeys, and other poultry. The emission method varied between layers (pullets under 19 weeks intended for laying, laying hens19 weeks and over, and layer and broiler breeders) and non-layers (broilers roasters and Cornish, turkeys, and other poultry). The emissions from layers were calculated by bird type using Equation 10. The number of livestock, PM emission factors, PM_{10} to PM and $PM_{2.5}$ to PM ratios, and hours per production cycle for layers is shown in Table 69.

The emissions from broilers (non-layers) were calculated by bird type using Equation 24. The number of livestock, PM emission factors, PM_{10} to PM and $PM_{2.5}$ to PM ratios, and hours per production cycle for broilers (non-layers) is shown in Table 70.

Equation 23: Particulate Matter Emissions from Poultry Layers

$$PM = Number\ of\ birds\ (head) \times Mass\ per\ animal\ (\frac{kg}{head}) \times EF_{PM,production\ cycle}\ (\frac{\frac{mg}{hr}}{kg\ bird}) \times Hours\ of\ production\ per\ year\ (8760) \times Particle\ size\ conversion$$

Equation 24: Particulate Matter Emissions from Poultry Broilers (non-layers)

$$PM = Number\ of\ birds\ (head) \times Mass\ per\ animal\ (\frac{kg}{head}) \times EF_{PM,production\ cycle}\ (\frac{\frac{mg}{hr}}{kg\ bird}) \times Hours\ of\ production\ per\ day\ \times (Days\ of\ production + days\ of\ cleanout) \times cycles\ per\ year \times Particle\ size\ conversion$$

Table 69: Emission Equation Factors for Poultry Layers

Census Livestock Category		Number of Head	Mass per Head kg/head	EF for Production Cycle mg/hr/kg	Hours per Production hr/yr
Poultry	Pullets under 19 weeks, intended for laying (63)	1605	0.75	1.266	8760
	Laying hens, 19 weeks and over (64)	5215	1.8	1.266	8760
	Layer and broiler breeders (pullets and hens) (65)	333	1.8	1.266	8760

Table 70: Emission Equation Factors for Poultry Broilers (non-layers)

Census Livestock Category		Number of Head	Mass per Head kg/head	EF for Production Cycle mg/hr/kg	Hours/Day hr/day	Days Production Days	Cleanout Days per Cycle Days	Cycles per Year Cycles/Year
Poultry	Broilers, roasters and Cornish (66)	11870	1	5.61	24	40	2	6.5
	Turkeys (67)	2067	4.9	5.61	24	75	2	3.5
	Other poultry	2585	1.8	5.61	24	75	2	3.5

The recommended method for horses separates the animals into horses in riding rings and in paddocks. This method uses the total number of horses from the Census of Agriculture and assumes a split between horses in riding rings (75%) and horses in paddocks (25%). The assumed splits are based on data from the Lower Fraser Valley with an assumption that the CVRD has similar splits. The general emission equation is shown in Equation 25 and the emission factors are shown in Table 71.

Equation 25: Particulate Matter Emissions from Horses

$$Emissions\ (kg) = Number\ of\ horses(head) \times EF(\frac{kg}{head})$$

Table 71: Particulate Matter Emission Factors for Horses

Pollutant	Horse Emission Factor (kg/head)	
	Paddocks	Riding Rings
PM	2.15	1.61
PM_{10}	0.72	0.54
$PM_{2.5}$	0.11	0.08

4.1.6 Crop Residue Burning

Open burning is one disposal option for excess vegetation (crop residue) from crop production. Emissions are based on an assumption of the amount of crop residue produced, the proportion of this residue which is disposed of by incineration, and an emission factor. Emissions from the burning of crop residue were calculated using Equation 26. The amount of crop residue produced is calculated using the land area in crops (by crop category) and an assumed rate of residue production (also called the fuel loading) per crop type.

Equation 26: Agricultural Waste Burning Equation

$$Emissions\ (kg) = Crop\ area\ (hectares) \times Fuel\ Loading\ \left(\frac{tonne\ residue}{hectare}\right) \times Percentage\ of\ dry\ crop\ residue\ burned\ (\%) \times Emission\ Factor\ \left(\frac{kg}{tonne\ residue}\right)$$

Crop residue production (fuel loadings) were assigned by crop category. The percentage of dry crop residue burned in various regions across the province was developed as part of the BC Agricultural Air Emissions Inventory to be 0.5%. PM emission factors per crop were selected from the California Air Resources Board and grouped into crop categories relevant to BC (California Air Resources Board, 2014). Emission factors and fuel loadings per crop type are shown in Table 72.

Table 72: Crop Residue Burning Emission Factors and Waste Production Rates

Land Cover Category	Emission Factors (kg/tonne)			Fuel Loading (tonnes/hectare)
	PM	PM_{10}	$PM_{2.5}$	
Corn	5.8	5.7	5.4	9.4
Field Crops - Vegetables	8.7	8.5	8.2	4.7
Orchard Crops	4.0	4.0	3.7	5.1
Vine Crops	3.2	3.2	3.0	4.7
Field Crops - Hay	8.7	8.5	8.2	4.7
Grapes	3.2	3.2	3.0	14.0

The crop area by crop type was taken from 2011 Census of Agriculture for the census consolidated subdivisions (CCSs) within the CVRD. Crop areas for specific crop fields and tables were grouped into crop categories matching the emission factors as shown in Table 73. The total area in hectares for each crop category and for each CCS in the CVRD are shown in Table 74.

Table 73: 2011 Census Tables and Fields per Crop Categories

Land Cover Category	Census Table	Census Fields	
Orchard Crops	Fruits Berries Nuts	Apples_total_area_hectares	Cherries_sour_total_area_hectares
		Pears_total_area_hectares	Peaches_total_area_hectares
		Plums_and_prunes_total_area_hectares	Apricots_total_area_hectares
		Cherries_sweet_total_area_hectares	
Grapes	Fruits Berries Nuts	Grapes_total_area_hectares	
Corn	Hay and Fieldcrops	Total_corn_44_hectares	
Field Crops - Vegetables	Vegetables excluding greenhouses	Total vegetables excluding greenhouse vegetables_hectares	
Field Crops - Hay	Hay and Fieldcrops	Total_wheat_43_hectares	Alfalfa_and_alfalfa_mixtures_hectares
		Oats_hectares	All_other_tame_hay_and_fodder_crops_hectares
		Barley_hectares	Forage_seed_for_seed_hectares
		Mixed_grains_hectares	Potatoes_hectares
		Total_rye_45_hectares	Mustard_seed_hectares
		Canola_rapeseed_hectares	Sunflowers_hectares
		Soybeans_hectares	Canary_seed_hectares
		Flaxseed_hectares	Ginseng_hectares
		Chick_peas_hectares	Buckwheat_hectares
		Lentils_hectares	Sugar_beets_hectares
		Dry_field_peas_hectares	Caraway_seed_hectares
		Dry_white_beans_hectares	Triticale_hectares
		Other_dry_beans_hectares	Other_field_crops_46_hectares
Vine Crops	Fruits Berries Nuts	Strawberries_total_area_hectares	Blueberries_total_area_hectares
		Raspberries_total_area_hectares	Saskatoons_total_area_hectares
		Cranberries_total_area_hectares	Other_fruits_berries_and_nuts_total_area_47_hectares

Table 74: Crop Area by Crop Category and CCS

CCS	Land Cover Category						Fuel Loading (tonnes/ hectare)
	Corn	Field Crops - Vegetables	Orchard Crops	Vine Crops	Field Crops - Hay	Grapes	
Comox Valley A	74.7	19	15	26.8	707.4	7	9.4
Comox Valley B (Lazo North)	0	28	11.3	21	322.9	13	4.7
Comox Valley C (Puntledge - Black Creek)	261.3	16	6.6	80.2	2584.7	5	5.1

APPENDIX 2: FIRE SURVEY REQUEST

Questions	Response
Does your fire service area allow open/backyard burning at some point during the year (or is it completely banned)?	*Yes/No*
If yes, please continue	
Does your fire service area allow open/backyard burning **without** a permit?	*Yes/No*
If so, which months is this allowed?	*Provide a range of months*
Can you estimate the amount of burning that occurs **without** a permit during this time?	*Use whatever description is most useful (e.g. "about twice the amount that occurs in months requiring permit", "about 100 fires", etc.)*
Does your fire service area issue permits for open/backyard burning?	*Yes/No*
If yes, during what months are these permits issued	*Provide a range of months*
If yes, how many permits were issued in **2015**?	*If exact values are not available please provide an estimate of the typical number of permits issued.*
If yes, how many permits were issued in **2014**?	*If exact values are not available please provide an estimate of the typical number of permits issued.*
Does this fire service area have any other specific burning requirements?	*e.g. restrictions on pile size, ventilation index, etc.*
Approximately how many complaints or reports of illegal burning do you receive per year?	
Given your experience, can you estimate about how many piles (with and without permit) are burned in your fire service area annually?	*Burns without permit:*
	Burns with permit:
Do you have any additional comments or insights on burning behaviours in your fire service area?	

What types of material do you typically observe being burned in your fire service area? (check all that apply and write in additional)	***Yes*** ✓	***No*** ✓
Wood or wood by-products (brush, waste wood)		
Grass or leaf litter (leaves, clippings, old grass)		
Landclearing (trees, bushes, fields)		
Agricultural waste (crop cover, trimmings/prunings)		
Residential garbage (including newspaper and cardboard)		
Hazardous domestic waste (plastics, paint, rubber)		
Other (please specify): _____		

THE CORPORATION OF THE CITY OF COURTENAY

BYLAW NO. 2954

A bylaw to amend City of Courtenay Fees and Charges Bylaw No. 1673, 1992

The Council of the Corporation of the City of Courtenay in open meeting assembled enacts as follows:

1. This bylaw may be cited for all purposes as **"City of Courtenay Fees and Charges Amendment Bylaw No. 2954, 2019."**

2. That "City of Courtenay Fees and Charges Bylaw No. 1673, 1992" be amended as follows:

   (a) That Schedule of Fees and Charges, Section III, Appendix IV "Garbage Collection Fees" be hereby repealed and substituted therefore by the following attached hereto and forming part of this bylaw:

   "Schedule of Fees and Charges Section III, Appendix IV – Solid Waste Collection Fees"

3. This bylaw shall come into effect upon final adoption hereof.

Read a first time this day of , 2019

Read a second time this day of , 2019

Read a third time this day of , 2019

Finally passed and adopted this day of , 2019

Mayor

Corporate Officer

SCHEDULE OF FEES AND CHARGES
CITY OF COURTENAY FEES AND CHARGES AMENDMENT BYLAW NO. 2954
SECTION III, APPENDIX IV
SOLID WASTE COLLECTION FEES

A.	Dwelling Basis Fee per unit per year -includes recyclables & yard waste pickup	$165.01
	Extra Bag Ticket (50 litre) - each	$2.50
B.	Residential Multifamily, Apartment, Strata per unit per year (Fee for yard waste, recyclables not included)	$144.97
	Additional service fee – yard waste pickup, per unit per year	$19.51

C. Trade Premises

Where mixed waste containers are determined to include recyclable materials, the fee imposed shall be two times the regular pickup fee.

Cans – mixed waste (contains no recyclable material)	**Per Pickup**
1 can or equivalent (1 can = 121 litres)	$2.87
Every additional can or equivalent 121 litres shall be charged at the rate of	$2.87
DCBIA – per unit/premise per year (includes two cans per week plus recyclables/cardboard pickup – this fee is charged to those units that are constrained by space and cannot implement a mixed waste bin or cardboard bin service)	$315.80

Containers - Mixed, Non-compacted (contains no recyclable material)

2 cubic yards	$17.18
3 cubic yards	$25.77
6 cubic yards	$51.56
12 cubic yards	$103.12
20 cubic yards	$171.86
Rate per cubic yard for sizes other than those listed above	$8.59

Compactors – Mixed Waste (contains no recyclable material)	**Per Pickup**
27 cubic yards	$464.35
28 cubic yards	$481.54
30 cubic yards	$515.91
35 cubic yards	$601.84
40 cubic yards	$687.78
For sizes other than those listed above: $464.35 (27 cubic yard base rate) + [(Y – 27) * $17.18 (2 cubic yard base rate)]	

Refuse to Recycling Centre (no tipping fees)	
DCBIA Recycle Toter Bin	$2.35 per bin
Containers	**Per Pickup**
2 cubic yards	$9.40
3 cubic yards	$14.10
6 cubic yards	$28.19
Sizes other than listed above charged at a rate per cubic yard of	$4.70

Compactors	**Per Pickup**
27 cubic yards	$154.83
30 cubic yards	$172.02
35 cubic yards	$200.71
40 cubic yard	$229.42
For sizes other than those listed above: $154.83 (27 cubic yard base rate) + [(Y – 27) * $5.73 (2 cubic yard base rate)]	

THE CORPORATION OF THE CITY OF COURTENAY

BYLAW NO. 2930

A bylaw to amend Zoning Bylaw No. 2500, 2007

The Council of the Corporation of the City of Courtenay in open meeting assembled enacts as follows:

1. This bylaw may be cited for all purposes as **"Zoning Amendment Bylaw No. 2930, 2018"**.

2. That "Zoning Bylaw No. 2500, 2007" be hereby amended as follows:

   (a) By adding subsection 8.11.1 (4) as follows:

   Notwithstanding the provisions of this bylaw a secondary suite is permitted on the property legally described as Lot 64, District Lot 159, Comox District, Plan 30921 (446 Qualicum Avenue).

3. This bylaw shall come into effect upon final adoption hereof.

Read a first time this 17th day of December, 2018

Read a second time this 17th day of December, 2018

Considered at a Public Hearing this 7th day of January, 2019

Read a third time this day of , 2019

Finally passed and adopted this day of , 2019

Mayor

Corporate Officer

Approved under S.52(3)(a) of the *Transportation Act*

Brendan Kelly, Development Technician
Ministry of Transportation and Infrastructure