



Home Heating and Air Quality Survey Report

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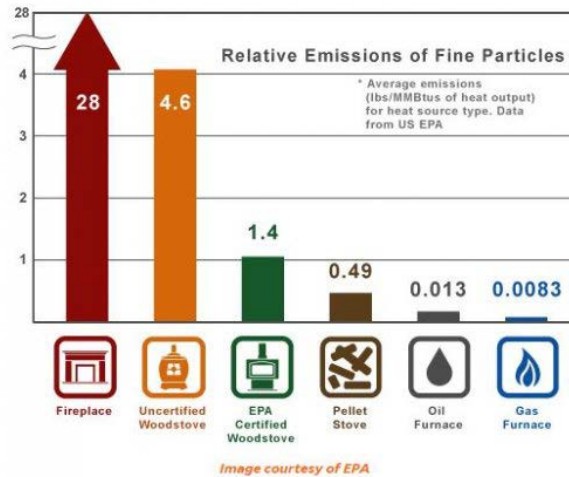
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2 INTRODUCTION

The need to design and administer a home heating and air quality survey came as a response to ambient measurements of particulate matter in Valemount exceeding federal and provincial air quality objectives. A monitoring station for PM_{2.5} and PM₁₀ has been in place since 2016. Reports from this station indicate that Valemount's air quality is rated extremely poor. In fact, in the 2015-2017 Central Interior Air Zone Report, Valemount had the highest PM_{2.5} levels in the zone. According to this monitoring station, PM_{2.5} is the main contributor to Valemount's poor air quality. The leading sources of PM_{2.5} are combustion of fossil fuels and wood, industrial activity, garbage incineration, and agricultural burning. Wood burning appliances are a dominant source of heat for residents of Valemount and the surrounding area.

According to the Environmental Protection Agency (EPA), EPA certified wood stoves emit 70% less fine particulates than uncertified wood stoves. Pellet and gas stoves further reduce emissions while heat pumps emit zero fine particulates. In an effort to reduce wood smoke pollution during the winter months The Village of Valemount applied to the Ministry of Environment's Wood Stove Exchange Program with two goals in mind:

1. Exchanging non-EPA certified wood stoves for new CSA/EPA certified stoves or another heating source.
2. Educating residents on proper wood burning practices and the harmful effects of particulate matter created by wood burning appliances.



Qualifying residents can receive a rebate of \$1,250 for an EPA/CSA certified wood replacement and a rebate of \$2,500 for a qualifying replacement with an alternative heat source. To date the Village has received 4 applications with 2 being approved for replacement and 2 denied due to their current stoves being ineligible. To be eligible for the program the appliance must be a non certified wood burning appliance that is installed as the primary source of heat. For full details on the Wood Stove Exchange Program please visit our website at www.valmeount.ca/grants.

There are 499 private dwellings occupied by usual residents in the Village of Valemount Municipal boundaries according to 2016 Census data [1].

To assist with long-term planning of the Wood Stove Exchange Program and other air quality initiatives, the purpose of the survey was to:

- 1) Understand how residents heat their homes (what percentage is heated by wood);
- 2) Identify the level of knowledge around smart wood burning practices; and
- 3) Identify resident's level of awareness regarding air quality and health in the Valemount area.

This document presents the findings from the home heating and air quality survey conducted in the Village of Valemount between June 2, 2020 and June 30, 2020.

3 METHODOLOGY

The purpose of the survey was to identify the age, number, and current state of wood-burning appliances in the community. The survey also gives the Village an understanding of behaviours and perceptions around wood burning and wood smoke and will help to inform future air quality initiatives and assist with long-term planning of the Wood Stove Exchange Program.

The purpose of the survey was to:

- 1) Understand how residents heat their homes (what percentage is heated by wood);
- 2) Identify the level of knowledge around smart wood burning practices; and
- 3) Identify resident's level of awareness regarding air quality and health in the Village of Valemount.

3.1 Design

The Home Heating and Air Quality Survey was created for all residents in Valemount to participate in regardless of how they heated their homes. Besides wood burning practices the survey was created to capture resident's perceptions of air quality in the Valemount area.

Other communities have implemented similar surveys in the past with positive results. Similar surveys were reviewed from Vanderhoof [2], Comox Valley [3], and Smithers [4] to better inform the questions asked to get similar results.

The Village of Valemount offered a \$250 gift card to Valemount Home Hardware as an incentive for residents to participate in the survey. To enter the draw participants were asked to provide their name and contact information at the end of the survey. Entering the draw and providing this information was optional. The gift card was awarded by a random draw that was completed after the June 30, 2020 deadline.

The complete survey can be found in Appendix A.

3.2 Distribution

The survey was open from June 2, 2020 till June 30, 2020 and could be completed online through Survey Monkey. Participants were asked to only fill out one survey per household. The Village of Valemount chose online participation only due to the ongoing COVID-19 pandemic. Accepting paper copies and door to door participation was not an option at this time. The Survey was advertised through the following methods:

- Posted on the Village of Valemount website and Wood Stove Exchange web page from June 2 – June 30.
- Several social media posts on the Village Facebook page throughout the month of June.
- Shared to the local buy and sell and discussion board Facebook pages.
- Advertised weekly in the Village newspaper ad.
- Advertised in the June Village of Valemount Newsletter (mailed to 878 postal boxes).
- Advertised with the monthly Wood Stove Exchange Newspaper ad for June.
- Advertised on VCTV (local television channel).

4 FINDINGS

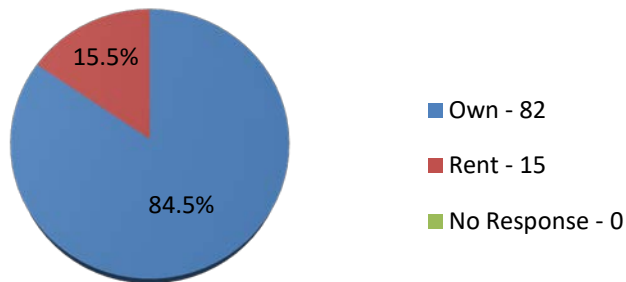
The Village of Valemount received 97 valid responses to the Home Heating and Air Quality Survey collected over a four week period. If one survey/household is taken into account, of the 499 private dwellings occupied by usual residents, 19.4% of households in Valemount responded to the survey.

The following section presents the data collected from the survey, in the order it was presented in the survey. The survey can be viewed in Appendix A.

4.1 Demographics

Respondents were asked if they own or rent their home. This question was asked because typically those that own their home have more control over their heating source than those renting. Of the 97 respondents 84.5% own their home while 15.5% rent.

Figure 1. Demographics of Respondants (n=97)



Respondents were asked the age and type of residence they occupy. 73% of respondents chose detached house with the second most common being mobile home at 19.5% (see figure 2 below). The age of homes fell most commonly in the 20-30, 30-40, and 40-50 year categories (see figure 3 below).

Figure 2. Type of Housing (n=97)

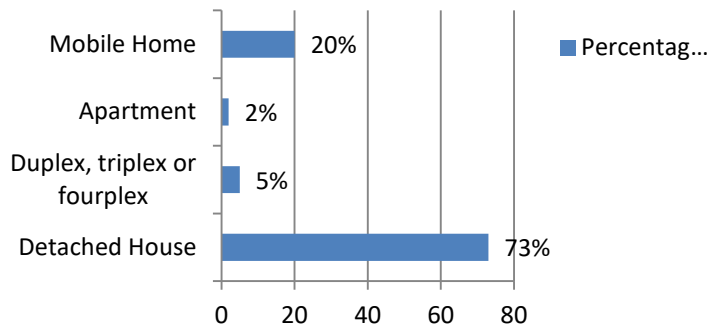
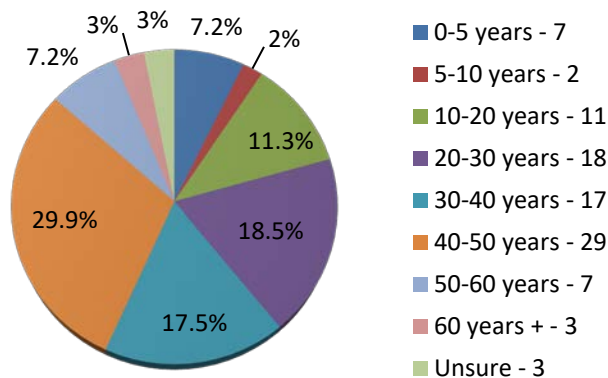


Figure 3. Age of Residence (n=97)

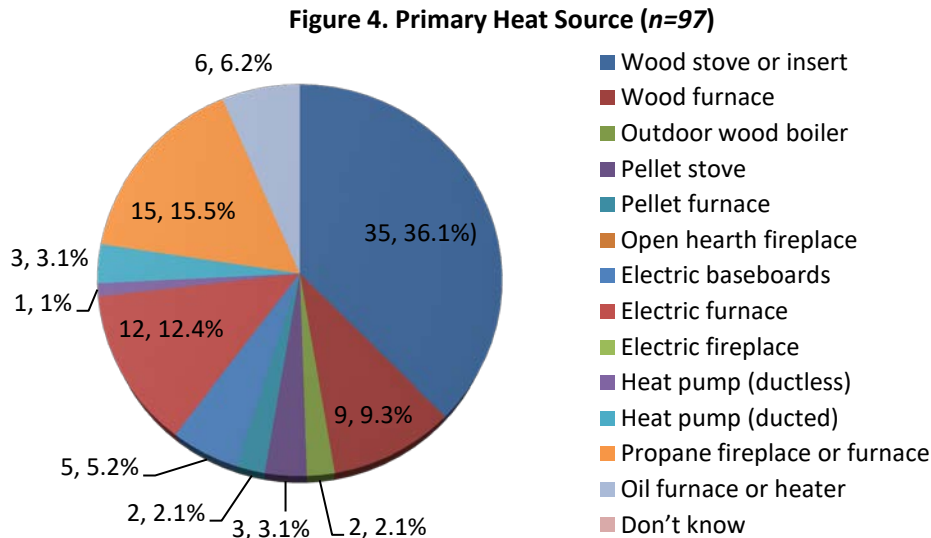


4.2 How Respondents Heat their Homes

Respondents were asked what they consider to be their home’s primary heating source (used for more than 50% of their home’s heating) during the winter months.

Primary Heating Source

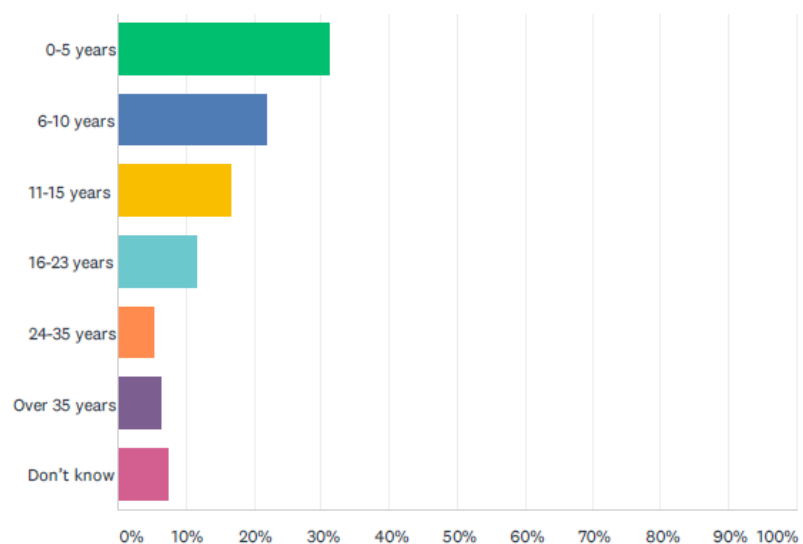
The majority of respondents (46, 47.5%) indicated that their primary heat source is wood, either a wood stove or inset (35, 36%), wood furnace (9, 9.2%), or an outdoor wood boiler (2, 2%). The second most common heating source is electricity (21, 21.6%). Electric sources are broken down into electric baseboards (5, 5.2%), electric furnace (12, 12.4%), and heat pump (1, 1% ductless and 3, 3.1% ducted). The remaining heating sources included Pellet stove (3, 3.1%) or furnace (2, 2.1%), Propane (15, 15.5%), and Oil (6, 6.2%).



Age of Primary Heat Source

Respondents were asked the age of their primary heating sources to assess efficiency and identify how close respondents might be to finding a replacement. The age of wood stoves give an idea of whether it has an EPA certification. Wood appliances older than 24 years are likely not EPA certified. The majority of respondents (67, 69%) indicated that their primary heating source is less than 15 years old. Only 11 respondents (11.3%) indicated their heating source is more than 24 years old. 7 respondents indicated that they were unsure of the age of their heating source.

Figure 5. Age of Primary Heating Source (n=96)



Secondary Heating Source

82.5% of total respondents indicated having a secondary heating source, while 17.5% indicated they did not have a secondary heating source.

Table 1. Comparison of respondents for each heating source; Primary vs. secondary.

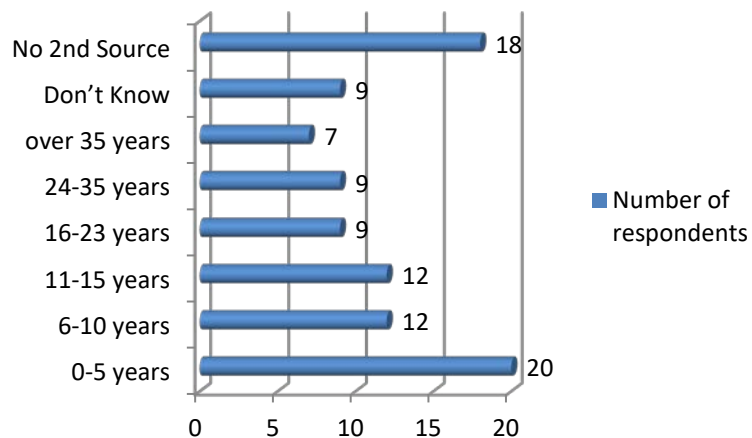
Type of heating System	Number Primary Heating Type	Percent Primary Heating Type	Number Secondary Heating Type	Percent Secondary Heating Type
Wood stove or insert	35	36.1%	10	10.3%
Wood furnace	9	9.3%	2	2.1%
Outdoor wood boiler	2	2.1%	1	1%
Pellet stove	3	3.1%	3	3.1%
Pellet furnace	2	2.1%	1	1%
Open hearth fireplace	0	0%	1	1%
Electric baseboards	5	5.2%	16	16.5%
Electric furnace	12	12.4%	16	16.5%
Electric fireplace	0	0%	3	3.1%
Heat pump (ductless)	1	1%	1	1%
Heat pump (ducted)	3	3.1%	1	1%
Propane fireplace or furnace	15	15.5%	11	11.3%
Oil furnace or heater	6	6.2%	5	5.2%
Other	0	0%	9	9.4%
No Other Heating Sources	-	-	17	17.5%
Total	97	100%	97	100%

- 47.5% of respondents use wood as their Primary Heat source while 13.4% use it as their secondary source.
- 21.7% of respondents use electricity as their primary heat source and 38.1% as their secondary heat source.
- Those that chose other mainly indicated they use electric space heaters as a secondary heat source. While 1 respondent indicated that the sun is their secondary heat source.

Age of Secondary Heating Source

Again, respondents were asked the age of their secondary heating sources to assess efficiency and identify how close respondents might be to finding a replacement. Of the respondents who use a secondary heating source (80) 45.8 % indicated it was less than 15 years old. 16% indicated their secondary heating source is more than 24 years old.

Figure 5. Age of Secondary Heating Source (n=96)



Other Heating Sources

31% of respondents indicated they use an additional (3rd) heating source. Of these responses the most common answer was electric baseboards followed by other where the majority of respondents specified electric space heaters. No respondents selected wood as an additional source of heat.

Respondents were asked if they have any wood heated outbuildings (garages, sheds etc.). Only 10 participants (10.3%) indicated they did have a wood heated outbuilding while 87 (89.7%) replied no to this question. Of the 10 respondents that indicated yes only 1 is older than 24 years suggesting it is most likely not EPA certified. 6 were indicated to be less than 15 years old and much more likely to be EPA certified appliances.

EPA/CSA Emissions Certification

We asked if using a wood burning appliance (as their primary, secondary or outbuilding heating source) if it has an EPA/CSA certification. Respondents were asked to skip this question if they do not burn wood. 56 respondents answered this question while 41 skipped it. It can be assumed that the 41 who skipped do not use a wood burning appliance.

48 (86%) respondents indicated that one of their wood burning appliances (primary, secondary, or outbuilding) is EPA/CSA Certified while 8 (14%) indicated that theirs is not certified.

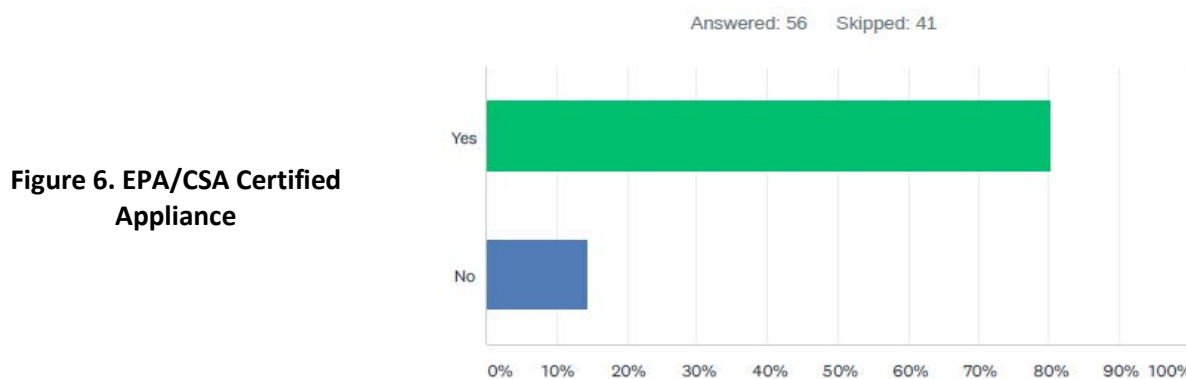


Figure 6. EPA/CSA Certified Appliance

We asked that respondents specify which of their wood stoves was certified (if they had more than one). Of the respondents that stated that one of their wood appliances was certified respondents mostly selected their primary heat source to be the certified appliance. Uncertified appliances tend to be used mainly as the secondary heat source or to heat an outbuilding.

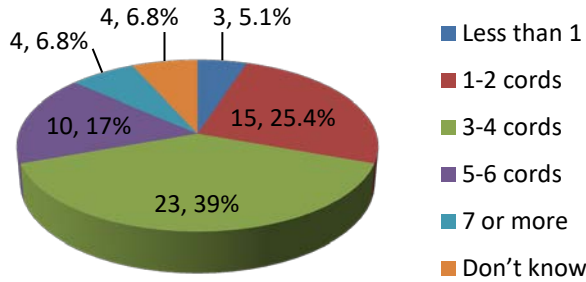
4.3 Wood Burning Practices

Participants were asked about their wood burning practices if they use a wood burning appliance. Those that do not burn wood were asked to skip these questions. Of the 97 participants approximately 60 answered these questions while 37 skipped them.

Amount of Wood Burnt

First, respondents were asked how much wood they burn on average each year to heat their homes or outbuildings. The definition of a cord was described as a 4'X4'X8' stack of split wood. The most common answer was 3-4 cords (23, 39%), followed by 1-2 cords (15, 25.4%), and 5-6 cords (10, 17%)

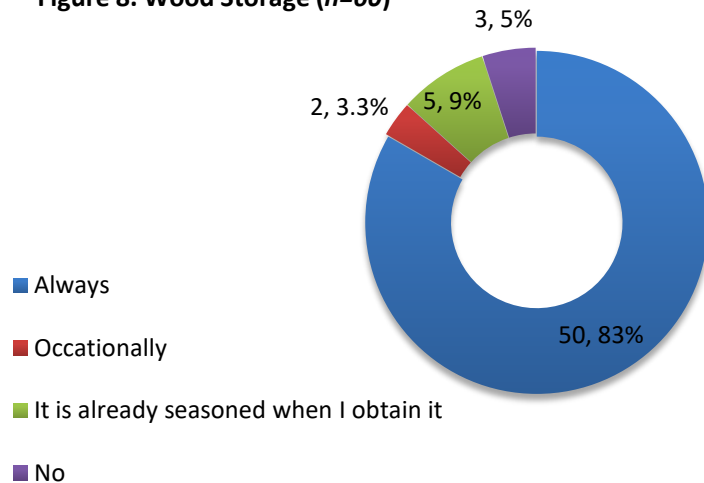
Figure 7. Amount of Wood (n=59)



Wood Storage

Participants were asked if they stack their wood under a sheltered area with sufficient air flow to at least three sides. This question was asked to gauge resident's perceptions on seasoning wood. 83.3% of respondents selected always, 8.3% said it's already seasoned when I obtain it, 5% stated no, and 3.3% said occasionally.

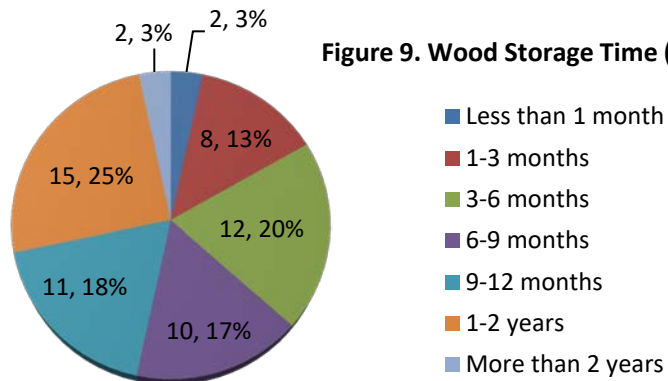
Figure 8. Wood Storage (n=60)



Length of Time Wood is Stored

Participants were asked how long they store their wood before burning it. This question was asked to gauge resident's perceptions on seasoning wood. It is recommended by the Ministry of Environment that wood be cut, split, and seasoned (dried) for a minimum of 6 months before burning [5].

Figure 9. Wood Storage Time (n=60)

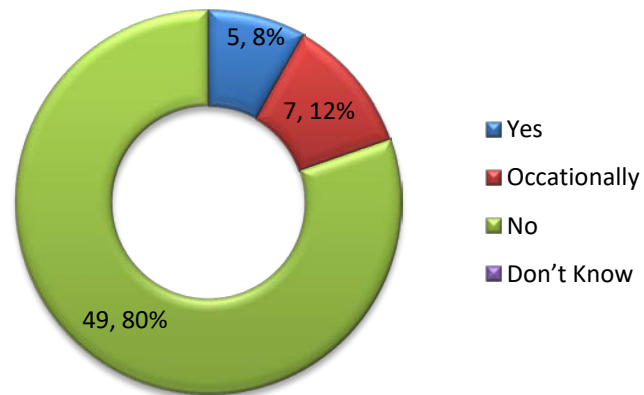


Moisture Content

Respondents were asked if they use a moisture meter to test the moisture of their wood before burning. Ministry of Environment recommends that the moisture content be 20% or less to reduce smoke when burning [5].

80% of respondents indicated that they do not use a moisture meter to test the moisture of their wood before burning while 8% selected yes and 12% indicated they test their wood occasionally.

Figure 10. Use of a Moisture Meter (n=61)



Where Respondents Obtain Firewood

Respondents were asked where they typically obtain their wood. Of the 60 responses to this question the most common answer (23%) was I salvage wood where I can get it (i.e. side of the road). The other most common responses were on my own property and from a friend or neighbour both with 17% of respondents. Those that selected other stated that they use a combination of the listed responses to obtain their wood for the year.

Figure 11. Where residents obtain firewood (n=60)

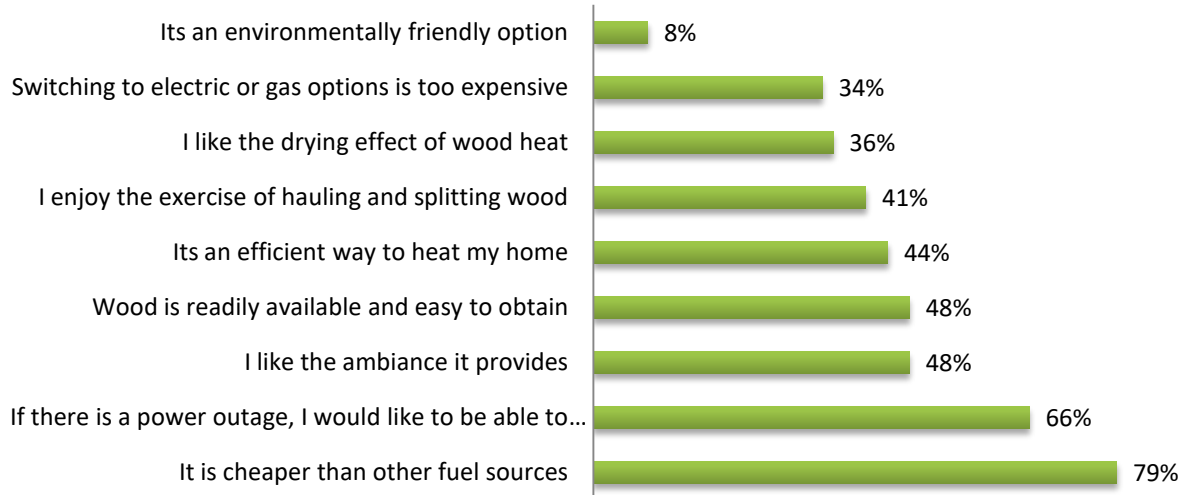


Pros and Cons to Burning Wood

The next questions were asked to determine residents reasoning behind burning wood a source of heat. Again respondents were asked to skip these questions if they do not use a wood burning appliance. 61 participants answered these questions while 36 skipped to the next section.

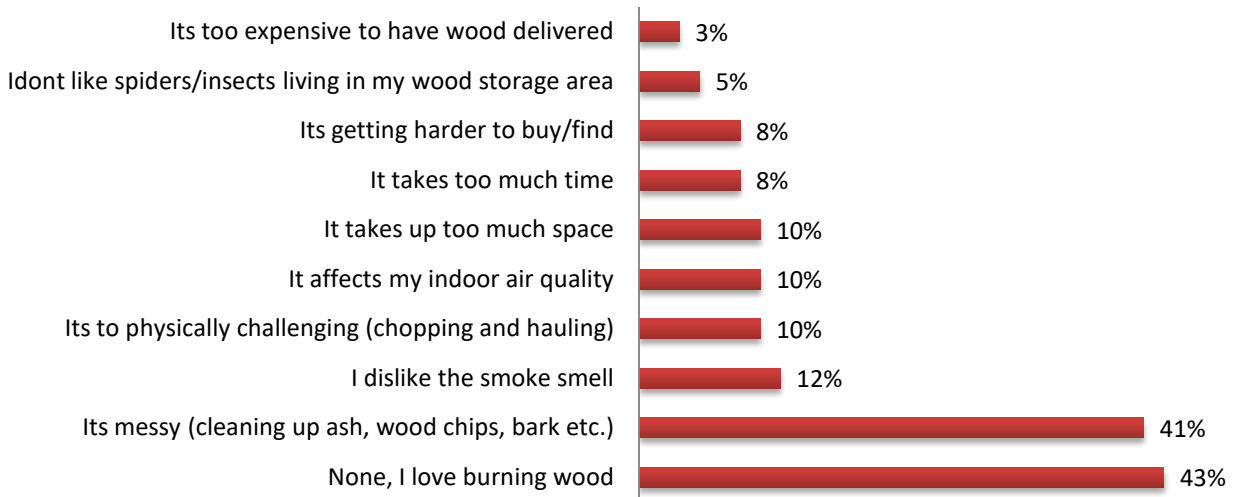
Figure 11 below summarizes the reason respondents burn wood as a source of heat. Respondents were asked to select all reasons that apply to them. The most common answer was that wood is cheaper than other fuel sources (48, 79%) followed by if there is a power outage; I want to be able to heat my home (40, 66%).

Figure 12. Reasons respondents heat their homes with wood (n=246)



Respondents were then asked if there were any reasons they dislike burning wood. They were asked to select all reasons that apply. Of the 61 respondents 26 (43%) selected none, I love burning wood followed closely by it's messy (25, 41%). See figure 12 for all responses.

Figure 13. Reasons respondents dislike using wood to heat their homes. (n=91)

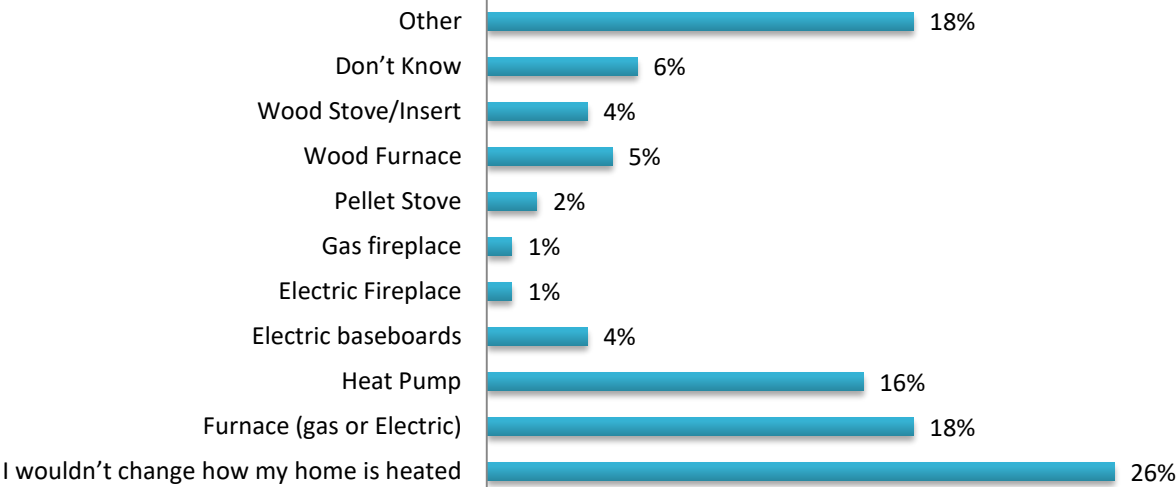


Preferred Heating Source

All respondents were asked if money were no object what would be your preferred way to heat your home. All 97 participants answered this question. 25 respondents (26%) selected was I wouldn't change anything. Electric

options were the most common with 37 respondents (38%) choosing electric options such as Furnace (gas or electric) (17, 18%), heat pump (15, 16%), Electric baseboards (4, 4%), and electric fireplace (1, 1%). 9 respondents selected wood options as their preferred heating source. Those that selected other stated that geothermal or natural gas would be their preferred heating source. See figure 13 below for all responses.

Figure 14. Residents preferred way to heat their homes. (n=97)



4.4 Impressions of Air Quality in Valemount

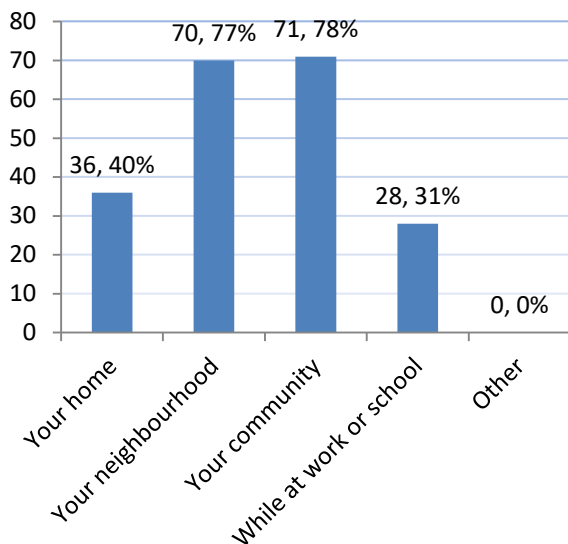
A series of questions were asked to gauge the level of awareness around wood smoke and its effects on air quality and health of residents.

Presence of Wood Smoke

A good way to determine the presence of pollutants from wood smoke is the ability to smell smoke in the air throughout the community. We asked respondents on occasion during the winter months, can you smell wood smoke in a) your home b) your neighbourhood c) your community, d) while at work or school, or e) other. Participants were asked to select all that apply.

Of the 97 respondents 91 responded to this question for a total of 205 responses. It can be assumed that the 6 that skipped do not smell smoke in any of the above. 71 (78%) respondents selected your community, followed by your neighbourhood with 70 respondents (77%), your home with 36 (40%), and while at work or school with 28 (31%). No respondents selected other.

Figure 15. Presence of Smoke in the Community (n=205)

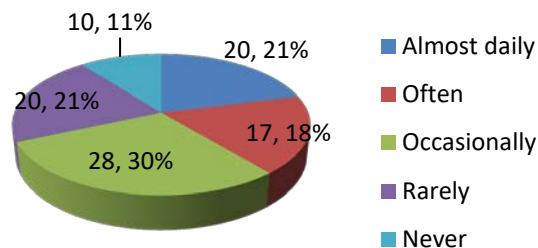


Wood Smoke and Air Quality

When asked how often smoke from residential burning affects air quality in respondents neighbourhoods during the winter months more than a third (38%) said Almost daily (20, 21%) or

often (17, 18%), 28 respondents (30%) said Occasionally, and less than a third (31%) said rarely (20, 21%) or never (10, 11%). See figure 16 below for all responses.

Figure 15. How often wood smoke affects air quality (n=95)



Interestingly, 77% of respondents stated that they could smell smoke on occasion in their neighbourhood, but only 69% said that wood smoke affects the air quality in their neighbourhood occasionally or more often. There may be a disconnect between smelling smoke and how that affects the air quality.

Wood Smoke and Health

Two questions were asked in regards to exposure to wood smoke and people's health. All 97 respondents answered these questions.

First, we asked Do you believe that exposure to residential wood smoke affects people's health? The majority 39% (38 respondents) selected yes, followed by Somewhat (18, 19%), Possibly (18, 19%), a little (14, 14%), and no (9, 9%). See figure 16.

Although 91% of respondents stated that they believe wood smoke affects people's health at least a little, in the following question, only 67% believe that wood smoke affects their health or that of their family. 33% of respondents don't believe that wood smoke affects their health or the health of their family at all. See figure 17. This may be because they do not see or feel the effects of poor air quality personally, therefore, don't believe it is affecting their health.

Figure 16. Respondents that believe wood smoke affects people's health (n=97)

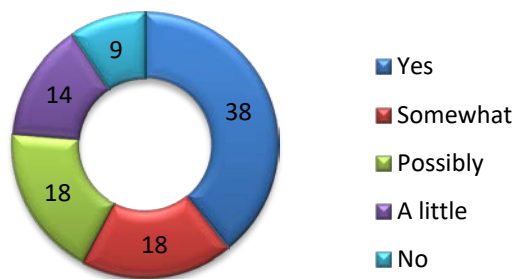
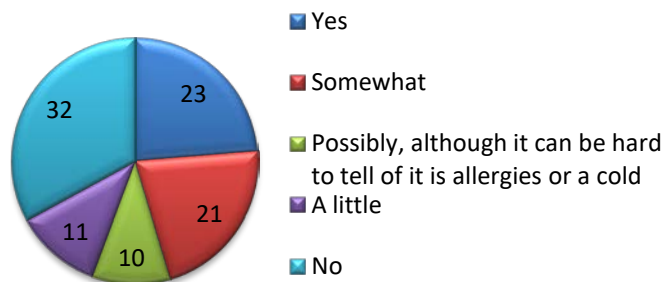


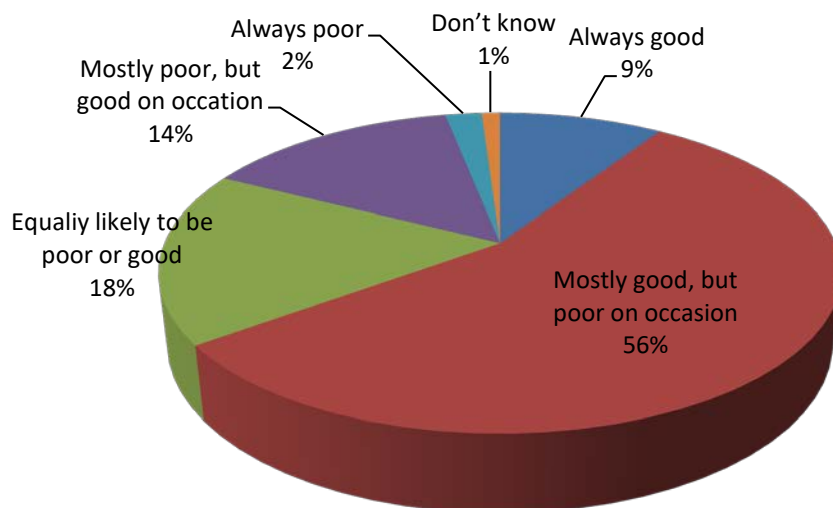
Figure 17. Respondents concerned that wood smoke affects their health or their family's health (n=97)



Overall Air Quality

Respondents were asked which statement best describes how they feel about air quality in Valemount. All 97 respondents answered this question. 56% of participants selected Mostly good, but poor on occasion, followed by equally likely to be poor or good with 18% and mostly poor but good on occasion at 14%. Only 9% selected always good and only 2% selected always poor. See Figure 18 below for full details.

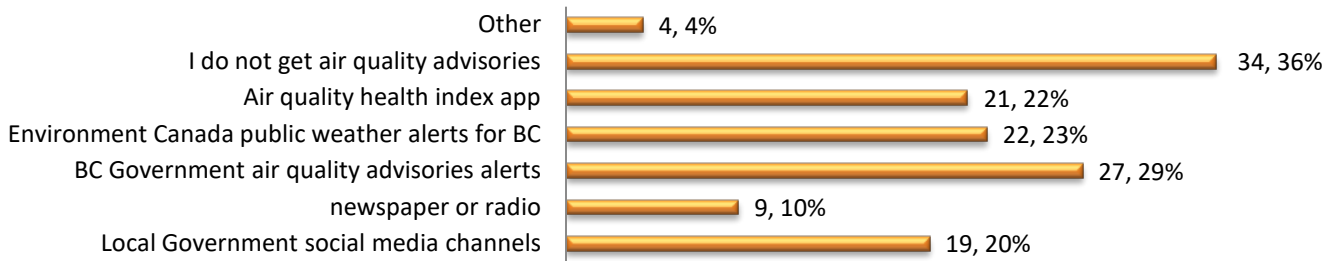
Figure 18. How residents feel about Valemount's air quality (n=97)



Air Quality Advisories

Respondents were asked how they find out about local air quality advisories. They were asked to select all that apply. The most selected answers were I don't get air quality advisories with 36% of respondents, followed by BC government air quality advisory alerts (29%) and Environment Canada public weather alerts (23%). Those that selected other stated they do the sniff test (2), hear it on CBC radio (1), and have a strong knowledge of weather patterns (1). See figure 19 below for full results. It is difficult for residents to fully understand the air quality in Valemount if they do not get air quality advisories or know how to find current air quality measures.

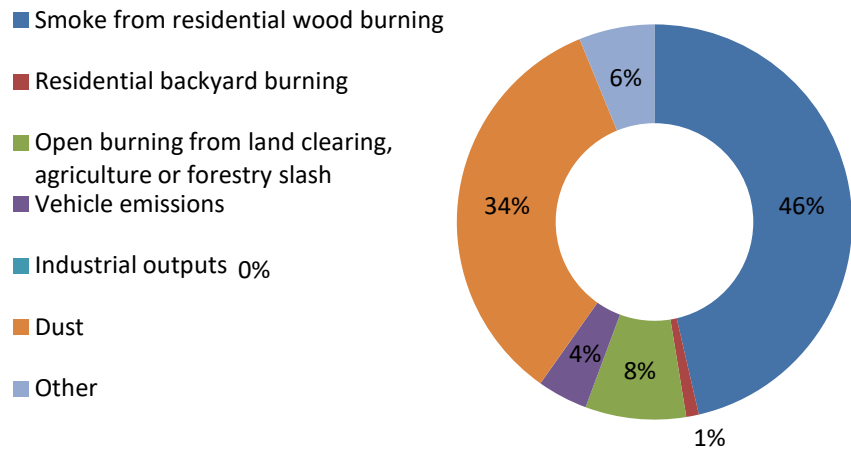
Figure 19. Air Quality Advisories(n=135)



Local Air Pollution Sources

Respondents were asked to what they think is the largest contributor to air pollution in Valemount. Almost half of respondents (45, 46%) believe it is from smoke from residential wood burning. The remaining respondents answers are split between the other choices, with the next largest choice (33, 34%) being dust, and then open burning from land clearing, agriculture or forestry slash (8, 8%). Full results can be seen in figure 20. Those that chose other stated Forest fires (3), Winter conditions (2), and burning garbage (1).

Figure 20. Contributors to poor air quality (n=97)



Awareness of the Wood Stove Exchange Program

We asked if respondents were aware of the Wood Stove Exchange program to gauge if our advertising efforts were reaching the public. 82% of respondents stated yes, while 18% were unaware of the program. Advertising efforts could be upped slightly to reach more people but overall the public seems to be aware of the program.

Figure 21. Awareness of the Wood Stove Exchange Program (n=96)



5 SUMMARY OF FINDINGS

The following are the key findings from the Home Heating and Air Quality Survey:

1. 47.5% of residents use wood as their Primary Heat source while 13.4% use it as their secondary source. In total 61% of residents use wood appliance as a heat source – Much higher than the average for BC outside of Metro Vancouver (30%) [6]
2. 86% of residents use an EPA/CSA certified stove while 14% are using an uncertified stove. Most uncertified stoves are being used as the secondary heat source or used to heat an outbuilding. Uncertified appliances do not burn fuel as efficiently and emit more smoke both indoors and outdoors.
3. 83% of residents store their wood correctly (sheltered with air flow to 3 sides) but only 63% store their wood for more than 6 months before burning (recommended seasoning time by the Ministry of Environment), and only 20% use a moisture meter to test the moisture content of their wood (moisture content is recommended to be 20% or less). Burning seasoned firewood produces more heat and less smoke, and can save money by reducing wood consumption by 25%.
4. Most residents who burn wood (79%) do so because it's cheaper than other heating sources such as electric or propane. Cost of heating is a major factor in residents' decision on how to heat their homes.
5. More than a third of residents (38%) would choose electric heat sources as their preferred choice if money were no option.
6. More than half of residents (69%) said that wood smoke affects the air quality in their neighbourhood occasionally or more often.
7. 91% of residents stated that they believe wood smoke affects people's health at least a little, but, only 67% believe that wood smoke affects their health or that of their family. 33% of residents don't believe that wood smoke affects their health or the health of their family at all.
8. 65% of residents believe that the overall air quality is good or mostly good, while 16% said that the air quality is poor or mostly poor; although 36% of residents stated they do not get air quality advisories at all.
9. 46% of residents believe our top contributor to poor air quality is wood smoke from residential heating while 34% believe the top contributor is dust.

6 CONCLUDING REMARKS

The survey was successful in providing information that will be useful in developing future air quality initiatives, especially, long term planning of the wood stove exchange program. The Village now has a bit more insight into resident's opinions on the issues of air quality and home heating.

2015-2017 Central Interior Air Zone Report provides data showing that smoke from wood burning is affecting the air quality in Valemount. This survey clearly shows that some education around the effects of wood smoke on health may need to be made a priority in the future. Education focused around wood burning practices would also be beneficial to help reduce wood smoke from those who continue to use wood as a heat source.

Because most not EPA/CSA certified stoves are used as secondary sources of heat and to heat outbuildings it would be beneficial to adapt the current Wood Stove Exchange program to be more inclusive to these sources of wood smoke. Opening up the program to older certified wood stoves could allow residents to move away from wood heat all together and could make the Wood Stove Exchange Program much more successful in improving air quality.

7 REFERENCES

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8 APENDICIES

8.1 Appendix A – Survey Questions

Home Heating and Air Quality Survey Questions

As part of the 2020 Wood Stove Exchange program, the Village of Valemount is conducting a residential home heating and air quality survey.

The purpose of this survey is to understand how residents heat their homes and to better understand their perceptions of local air quality and wood burning practices.

The information collected on this form is gathered under the authority of Section 26 (c) of the Freedom of Information and Protection of Privacy Act and will be used solely for planning future air quality programs. The information will be available to the public upon request in a summarized format. Should you have any questions about the collection and use of this information, please contact Carleena Shepherd by emailing corporate@valemount.ca or by calling 250-566-4435.

Please take 10 minutes to complete the survey to the best of your knowledge. Upon completion, you can enter to win a \$250 Gift Card to Valemount Home Hardware.

1. What do you consider to be your home’s primary heating source (used for more than 50% of your home’s heating) during the winter months? (Choose one that best applies)
 - a. Wood stove or insert
 - b. Wood furnace
 - c. Outdoor wood boiler
 - d. Pellet stove
 - e. Pellet furnace
 - f. Open hearth fireplace
 - g. Electric baseboards
 - h. Electric furnace
 - i. Electric fireplace
 - j. Heat pump (ductless)
 - k. Heat pump (ducted)
 - l. Propane fireplace or furnace
 - m. Oil furnace or heater
 - n. Other: _____
 - o. Don’t know

2. Approximately how old is this heating appliance?
 - a. 0-5 years
 - b. 6-10 years
 - c. 11-15 years
 - d. 16-23 years
 - e. 24-35 years
 - f. Over 35 years
 - g. Don’t know

3. What would you consider to be your secondary heating source (used for less than 50% of your home's heating) during the winter months? (Choose one that best applies)
- a. Wood stove or insert
 - b. Wood furnace
 - c. Outdoor wood boiler
 - d. Pellet stove
 - e. Pellet furnace
 - f. Open hearth fireplace
 - g. Electric baseboards
 - h. Electric Furnace
 - i. Electric fireplace
 - j. Heat pump (ductless)
 - k. Heat pump (ducted)
 - l. Propane fireplace or furnace
 - m. Oil furnace or heater
 - n. Don't know
 - o. Other: _____
 - p. No other heating sources
4. Approximately how old is this heating source?
- a. 0-5 years
 - b. 6-10 years
 - c. 11-15 years
 - d. 16-23 years
 - e. 24-35 years
 - f. Over 35 years
 - g. Don't know
5. Do you have any other heating sources in your home? (Choose all that apply)
- a. Wood stove or insert
 - b. Wood furnace
 - c. Outdoor wood boiler
 - d. Pellet stove
 - e. Pellet furnace
 - f. Open hearth fireplace
 - g. Electric baseboards
 - h. Electric Furnace
 - i. Electric fireplace
 - j. Heat pump (ductless)
 - k. Heat pump (ducted)
 - l. Propane fireplace or furnace
 - m. Oil furnace or heater
 - n. Don't know
 - o. Other: _____

- p. No other heating sources
6. Do you have any wood-heated outbuildings (such as a shop, garage or shed)?
- Yes
 - No
 - Don't know
7. Please skip to the next question if you stated 'no' above. Approximately how old is your wood-burning appliance in your outbuilding?
- 0-5 years
 - 6-10 years
 - 11-15 years
 - 16-23 years
 - 24-35 years
 - Over 35 years
 - Don't know
 - Other (please explain) [insert text box]
8. If you use a wood burning appliance in your home or outbuilding, does it have EPA or CSA emissions certification?
- Yes
 - Yes, one is EPA or CSA certified. Specify: _____
 - No
9. If money were no object, what would be your preferred way to heat your home? (Please choose one that best applies)
- I wouldn't change anything about how my home is heated
 - Furnace (gas or electric)
 - Heat pump (electric, ducted or ductless)
 - Electric baseboards
 - Electric fireplace
 - Gas fireplace
 - Pellet stove
 - Wood furnace
 - Wood stove/insert
 - Don't know
 - Other (please explain)
10. If you do not burn wood please skip to question 17. Approximately how many cords of wood do you burn on average each year to heat your home or outbuilding(s)? (One cord is equivalent to 4'x4'x8' of stacked split wood)
- I don't burn wood
 - 0-1
 - 1-2
 - 3-4

- e. 5-6
 - f. 7 or more
 - g. Don't know
 - h. Other (specify number of bundles, truck loads, etc.)
11. Where do you typically obtain your wood? (Choose the best answer)
- a. My own property
 - b. From a friend or neighbour
 - c. I cut myself on crown land with a valid Firewood Permit
 - d. I salvage wood where I can get it (i.e. side of the road)
 - e. I order from someone who advertises on Kijiji, Facebook or the newspaper
 - f. A local timber mill
 - g. Purchase pellets from a local distributor or order online
 - h. Other (please describe) [insert text box]
 - i. I did not obtain wood this year (please explain)
12. Do you stack your wood under a sheltered area with sufficient airflow on at least three sides to reduce the moisture content (i.e. season your wood)?
- a. Always
 - b. Occasionally
 - c. It is already seasoned when I buy/obtain it
 - d. No
13. How long do you season your firewood before you burn it?
- a. Less than 1 month
 - b. 1-3 months
 - c. 3-6 months
 - d. 6-9 months
 - e. 9-12 months
 - f. 1-2 years
 - g. More than 2 years
14. Do you use a moisture meter to test the moisture content of your wood before burning it? (A moisture meter is a digital device that provides a percentage moisture content reading of the wood.)
- a. Yes
 - b. Occasionally
 - c. No
 - d. Don't know
15. For what reasons do you burn wood to heat your home? (Choose all that apply)
- a. It is cheaper than other fuel sources like electricity or gas
 - b. I like the ambiance it provides in my home
 - c. Switching to electric or gas options are too expensive
 - d. I like the drying effect of wood heat
 - e. Wood is readily available and easy to obtain

- f. If there is a power outage, I want to be able to heat my home
- g. It is an efficient way to heat my home
- h. It is an environmentally friendly option
- i. I enjoy the exercise of hauling and splitting wood
- j. Other (please explain)

16. Are there any reasons you dislike burning wood? (Choose all that apply)

- a. None, I love burning wood
- b. It's too physically challenging (chopping and hauling wood)
- c. It's messy (cleaning up ash, wood chips, bark, etc.)
- d. I dislike the smoke-smell
- e. It affects my indoor air quality
- f. It takes too much time
- g. It takes up too much space
- h. I don't like the spiders and insects living in my wood storage area
- i. It's too expensive to have wood delivered
- j. It is getting harder to buy/find
- k. Other (please explain)

17. If you use a pellet stove, how many bags, pallets, or tones of pellets do you use each year?

- a. Bags: _____
- b. Pallets: _____
- c. Tones: _____
- d. I do not have a pellet stove

18. Do you own or rent your residence?

- a. Own
- b. Rent

19. What type of housing do you currently occupy?

- a. Detached house
- b. Duplex, triplex, or fourplex
- c. Apartment
- d. Mobile home

20. What is the age of your place of residence?

- a. 0-5 years
- b. 5-10 years
- c. 10-20 years
- d. 20-30 years
- e. 30-40 years
- f. 40-50 years
- g. 50-60 years
- h. 60+ years
- i. Don't know

21. On occasion during the winter months, can you smell wood smoke in...(Choose all that apply)?
- Your home?
 - Your neighbourhood?
 - Your community?
 - While at work or school?
 - Other (please explain)
22. How often does smoke from residential burning affect air quality in your neighbourhood during the winter months? (Choose the answer that best applies)
- Almost daily
 - Often
 - Occasionally
 - Rarely
 - Never
23. Do you believe that exposure to residential wood smoke affects people's health?
- Yes
 - Somewhat
 - Possibly
 - A little
 - No
24. Are you concerned that your health or your family's health might be affected by wood smoke in the Valemount Area?
- Yes
 - Somewhat
 - Possibly, although it can be hard to tell if it's a cold or allergies
 - A little
 - No
25. Which of the following statements describes how you feel about the air quality in Valemount?
- Always good
 - Mostly good, but poor on occasion
 - Equally likely to be poor or good
 - Mostly poor, but good on occasion
 - Always poor
 - Don't know
26. How do you find out about local air quality advisories?
- Local government social media channels
 - Local newspaper or radio
 - BC Government Air Quality Advisories Alerts
 - Environment Canada Public Weather Alerts for BC
 - Air Quality Health Index App

- f. I do not get Air Quality Advisories
- g. Other (please explain)

27. What do you think is the biggest contributor to poor air quality in Valemount?

- a. Smoke from residential wood burning
- b. Residential backyard burning
- c. Open burning from land clearing, agriculture or forestry slash
- d. Vehicle emissions
- e. Industrial outputs
- f. Other

28. Are you aware that the Valemount Wood Stove Exchange Program is providing rebates to exchange old, non-EPA or CSA certified wood stoves with new certified wood stoves (\$1,250 rebate), or other heating source (\$2,500)?

- a. Yes
- b. No

29. Any other comments or suggestions regarding home heating or local air quality? [Insert large text box]

Thank you for taking the time to complete our survey. To be entered to win....., please enter your name and phone number below. This information will only be used to contact the winner, and will not be associated with individual results or used in any other way.

Name: _____

Phone: _____

Thank you for submitting your survey. Please only submit one survey per household.

8.2 Appendix B – Additional Comments

Additional Comments

- Get natural gas into Valemount
- I know wood burning is an issue for air quality, but there are a lot of benefits to burning wood, including the fact that we have lots of dead pine trees, and wood waste from logging operations nearby. But DUST is also a concern - from roads and alleys but especially from Kinbasket when the water is low - I can often taste the dust when it is blowing off Kinbasket, and feel the scratch from it in my lungs.
- It would be great to get geothermal into the village and we could hook up to it individually. Or if electric heat could be much cheaper.
- Given we live in a northern climate, that we have to heat our homes for 8 months of the year (unlike lotus land), I am still waiting to see an elimination or at least a reduction in the two tiered kWh rate, and perhaps even in the stage 1 rate for northerners who would like to convert to electricity. Propane is not only causing huge extraction and processing emissions just to produce it, but again to ship it here. Even if it was affordable, which it is not for most northern residents. Rebates and incentives for low income homes, for energy savings improvements, should not be a federal 1-time offer, but available across the board for home heating efficiencies (at least for northern residents, for residents in the northern climates, also where the installation and delivery costs are enormous, if not prohibitive, or rarely affordable. Again, we live in valley bottoms in BC. Bad air quality will cost us, and governments either in terms of long term health care, or better, just to subsidize any time availability of home heating and insulation grants to facilitate a steady process of home improvements- understanding that all of these subsidies and for a longer term will provide employment opportunities and a stronger economy as we move to be more environmentally responsible, and better health for us all.
- People who burn wood inefficiently (causing lots of smoke) should be educated about seasoning wood and not dampening down their wood stoves causing it to smolder. If it continues, other incentives should be explored. Semi-trucks should not be allowed to idle within the village.
- The village and residents should be going after Hydro for the atrocious mess down the lake that is the creator of incredibly bad air. They (Hydro) consider silica sand a reason for wearing hazmat suits when their workers are working on this lake, yet don't seem to care that residents of this valley breathe it in all year round. It is a known carcinogen.
- Agree dust is also a big factor to poor air quality here
- Air quality in Valemount is very good in the summer, but in the winter you cannot leave the windows open without waking up to the taste of smoke in your mouth.
- I think that people who burn wood should have to pay a carbon tax or people who use cleaner ways to heat their homes receive a rebate/bonus.
- sufficient insulation (super-insulate) cooking and baking Put on a sweater Use a water bottle turn on a bed warmer 30 minutes before retiring and turn off when getting into bed turn down the thermostat hot drinks
- Rather than a wood exchange program, it would be nice to see financial incentives for residents to give up wood stoves in exchange for pellet stoves, solar or heat pumps, or even funding for improved insulation, windows in houses. There would also be a property tax incentive for those who do not heat with wood -- it would mean that the tax base would have to be revised -- those who heat with wood would pay higher property taxes while those who don't would pay lower property taxes. Also, while I indicated that residential heating is the highest cause of poor air quality, it was because that happens

over a longer period of time than industrial burning. When the industrial burning is taking place, it often creates far worse air quality than residential, but is for a shorter period of time.

- I would not be able to afford to heat my home if not for the wood heat i have a wood boiler system that heats my house, water, and shop. When we decided to purchase the system my hydro bills were 650 a month and that was way before the hydro cost continually increased. I believe that the very cold nights of 30 below would make it near impossible to afford if not for the wood heat
- Electric heat is the cleanest and greenest yet we pay the most. It's no wonder resident's burn wood and we are switching to wood. Two tier elect. rates are unfair and council should embrace this. Until this is not ignored more residents will burn wood and there will be an air quality concern and council will have to live with it as there is little alternative. We have a limitless wood supply. It should be utilized
- Getting wood here is the biggest problem. I thought it would be easy to get a logging truck of wood every few years to cut and split myself, but any time we look or reach out to local loggers, Facebook, etc. we are only met with negative feedback and/or exorbitant prices. It was way easier and less costly to get seasoned birch back in Alberta where we moved from. This is not right! I've seen other sources for logging trucks of wood in other BC communities for good prices (ie \$700 to \$1000 for a full logging truck) listed on-line, but nothing in the Robson valley - why? The Village & Regional district has to address this problem and work with forestry so residents can have easy & affordable access to logging trucks of good fire wood. That or make BC Hydro listen and get them to abolish 2-tier. We never planned on burning as much wood as we do. We put in our wood appliance primarily for ambiance and a secondary emergency heating source because we knew power outages here could last days; but since 2-tier billing was introduced back in 2008, we are forced to burn way more wood than we panned. That's the real issue! Electric heat is clean, efficient, and the infrastructure is already in place. If we all heated with electric, air quality would improve by orders of magnitude overnight. It just costs way too much per kWh. I'm sick and tired of doing my part to limit carbon output (we spent over \$20K on our electric heat pump system), and yet government and the BC Utilities Commission/BC Hydro just slaps me in the face for my efforts. Why did I even bother trying?
- Thank you for having this survey - are there paper copies as well?
- It is a witch hunt in Valemount against wood burning. A lot of resident's burn wood properly and have a proper wood stove.
- Need new bylaw....catalytic converters on all new installations and replacement wood stoves. Old stoves without a CC must be replaced within say....5 or 10 years.
- The high rate of the local taxes and the high cost of living in the community prohibit many people with low incomes or on a fixed income from being able to afford anything other than burning wood as a primary heat source.
- We had 2 open fireplaces, a pellet stove and propane furnace when we bought the house in 2004. When we put a wood stove insert into basement fireplace, our house insurance increased. That is why we haven't done anything with our upstairs open fireplace. Funny, I think inserts are safer than open fireplaces.
- While everyone is quick to jump on the home-owner for burning poorly seasoned wood etc, maybe it is time to target the suppliers and educate them in the proper procedures for procuring and supplying wood, When I was buying wood, I bought it in good faith that it was properly seasoned and dried. If I threw a 30" log on the fire and it started belching black smoke, I seriously had no choice but to let it burn out. there was literally no way I could remove that log from the inferno without suffering burns to myself

- I would like to see more regulations around wood burning especially when it is not that cold out. It would also be nice to encourage electric lawn mowers as gas ones pollute the whole neighbourhood when people are trying to enjoy a nice sunny day.
- no
- my stove which is old has a broken damper mechanism and I cannot control the amount of emissions as a result but is CSA and EPA certified and I'm not a candidate for stove exchange program